



# Sun SPARC® Enterprise M3000 Server Service Manual

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## **Abbreviations Abbreviations-1**

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# Preface

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The *Sun SPARC® Enterprise M3000 Server Service Manual* describes how to service the Sun SPARC Enterprise M3000 server. References herein to the SPARC Enterprise M3000 server and the M3000 server are references to the Sun SPARC Enterprise M3000 server.

This document is written for maintenance providers who have received formal service training or customers who have received training under a self-maintenance contract. A single engineer service model is used for servicing the SPARC Enterprise M3000 server with one exception. When the motherboard of a Sun SPARC Enterprise M3000 server must be removed and that server is mounted above waist high in the cabinet, two engineers or a platform must be used for safety.

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# How This Document Is Organized

This document is organized into the following chapters:

[Chapter 1](#) explains safety precautions required for maintenance.

[Chapter 2](#) explains the names of components and the LEDs on the operator panel and rear panel.

[Chapter 3](#) explains fault diagnosis information.

[Chapter 4](#) explains the method of preparing for the safe replacement of FRUs.

[Chapter 5](#) explains how to access internal components.

[Chapter 6](#) explains how to replace the motherboard unit.

[Chapter 7](#) explains how to replace and install memory (DIMMs).

[Chapter 8](#) explains how to replace and install PCIe cards.

[Chapter 9](#) explains how to replace and install a hard disk drive.

[Chapter 10](#) explains how to replace the hard disk drive backplane.

[Chapter 11](#) explains how to replace the CD-RW/DVD-RW drive unit.

[Chapter 12](#) explains how to replace a power supply unit.

[Chapter 13](#) explains how to replace a fan unit.

[Chapter 14](#) explains how to replace the fan backplane.

[Chapter 15](#) explains how to replace the operator panel.

[Appendix A](#) explains the server nomenclature and component numbering.

[Appendix B](#) explains memory (DIMM) mounting conditions.

[Appendix C](#) explains FRUs.

[Appendix D](#) explains connector specifications for external interfaces

[Appendix E](#) explains the UPS controller (UPC) that controls the uninterruptible power supply (UPS) unit.

[Abbreviations](#)

[Index](#)

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## Related Documentation

The documents listed as online are available at:

<http://docs.sun.com/app/docs>

For late-breaking information about hardware, software, or documentation for the Sun SPARC Enterprise M3000 server, refer to the *Sun SPARC Enterprise M3000 Server Product Notes*.

Application	Title	Format	Location
Overview	<i>Sun SPARC Enterprise M3000 Server Overview Guide</i>	PDF HTML	Online
Planning	<i>Sun SPARC Enterprise M3000 Site Planning Guide</i>	PDF HTML	Online
Safety/Compliance	<i>Sun Fire M3000 Server Safety and Compliance</i>	Hard Copy PDF HTML	Shipping kit Online
Getting Started	<i>Sun SPARC Enterprise M3000 Server Getting Started Guide</i>	Printed PDF	Shipping kit Online
Installation	<i>Sun SPARC Enterprise M3000 Server Installation Guide</i>	PDF	Online
Software Administration	<i>Sun SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Administration Guide</i>	PDF HTML	Online
Software Administration	<i>Sun SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide</i>	PDF HTML	Online
Glossary	<i>Sun SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers Glossary</i>	PDF HTML	Online
Hardware/Software Product Notes	<i>Sun SPARC Enterprise M3000 Server Product Notes</i>	PDF HTML	Online

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# Safety Precautions for Maintenance

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This chapter provides safety precautions required for maintenance.

- [Section 1.1, “ESD Precautions” on page 1-1](#)
- [Section 1.2, “Server Precautions” on page 1-3](#)

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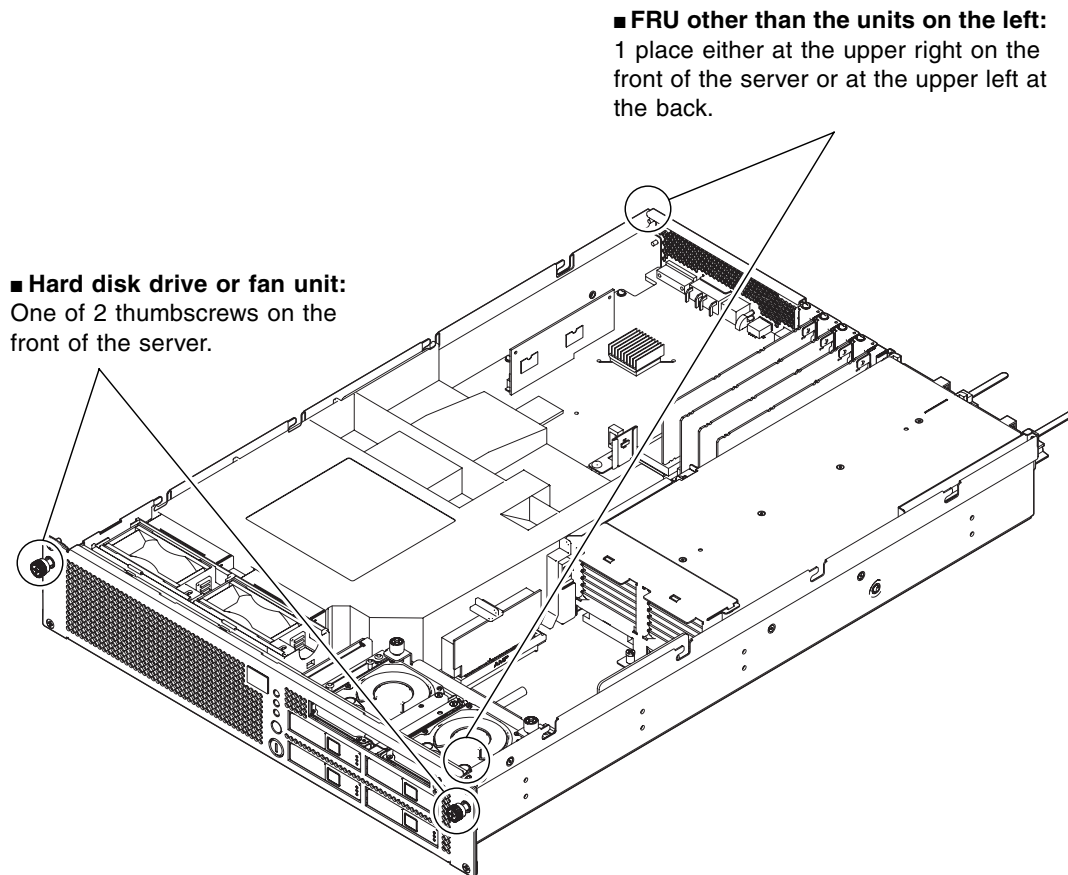
## 1.1 ESD Precautions

To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the following safety precautions.

**TABLE 1-1** ESD Precautions

Item	Precaution
ESD jack/wrist strap	Connect the ESD connector to your server and wear the antistatic wrist strap when handling printed circuit boards. See <a href="#">FIGURE 1-1</a> , for the wrist strap connection destination.
Conductive mat	An approved conductive mat provides protection from static damage when used with a wrist strap. The mat also cushions and protects small parts that are attached to printed circuit boards.
ESD safe packaging box	Place a printed board or component in the ESD safe packaging box after you remove it.

**FIGURE 1-1** Wrist Strap Connection Destination



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**Caution** – Do not connect the wrist strap cable to the conductive mat. Connect it directly to the server.

---

The wrist strap and FRU must have the same level of potential.

---

## 1.2 Server Precautions

When maintaining the server, observe the following precautions for your protection.

- Follow all cautions, warnings, and instructions marked on the server.



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**Caution** – Do not insert any object in an opening of the server. If any object comes into contact with a high-voltage part or short-circuits a component, fire or electric shock might result.

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- Refer servicing of the server to the service engineer.

### 1.2.1 Electrical Safety Precautions

- Ensure that the voltage and frequency of the AC power source to be used matches the electrical rating labels on the server.
- Wear antistatic wrist straps when handling hard disk drives, motherboard units, or other printed circuit boards.
- Use grounded power outlets as described in the *SPARC Enterprise M3000 Server Installation Guide*.



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**Caution** – Do not make mechanical or electrical modifications. We are not responsible for regulatory compliance of modified servers.

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### 1.2.2 Equipment Rack Safety Precautions

- The equipment racks must be anchored to the floor, ceiling, or to adjacent frames.
- Some equipment racks are supplied with a stabilizer feature, which supports the weight of the server when it is extended on its slide rails. This prevents the equipment from toppling over during installation or maintenance.
- In the following cases, a safety evaluation must be conducted by the service engineer prior to installation or maintenance work.
  - When no stabilizers are attached and the equipment rack is not anchored to the floor, ensure safety by confirming that the server does not fall over when it is pulled out from the slide rails.

- When the equipment rack is mounted on a raised floor, ensure that the raised floor has sufficient strength to withstand the weight upon it when the server is extended on its slide rails. Fix the equipment rack through the raised floor to the concrete floor below it, using a proprietary mounting kit for this purpose.



---

**Caution** – If more than one server is installed in an equipment rack, maintain the servers one at a time.

---

For details of equipment racks, see the *SPARC Enterprise Equipment Rack Mounting Guide*.

### 1.2.3

## Component Handling Precautions



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**Caution** – The server is easily damaged by static electricity. To prevent damage to printed circuit boards, wear a wrist strap and connect it to the server prior to starting maintenance.

---



---

**Caution** – Do not bend the motherboard unit (MBU) or the components mounted on circuit boards might be damaged.

---

To prevent the motherboard unit from being bent, observe the following precautions:

- Hold the motherboard unit by the handle, where the board stiffener is located.
- When removing the motherboard unit from the packaging, keep the motherboard unit horizontal until you lay it on the cushioned conductive mat.
- Connectors and components on the motherboard unit have thin pins that bend easily. Therefore, do not place the motherboard unit on a hard surface.
- Be careful not to damage the small parts located on both sides of the motherboard unit.



---

**Caution** – The heat sinks can be damaged by incorrect handling. Do not touch the heat sinks while replacing or removing motherboard units. If a heat sink is loose or broken, obtain a replacement motherboard unit. When storing or carrying a motherboard unit, ensure that the heat sinks have sufficient protection.

---





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**Caution** – When removing a cable such as the LAN cable, if your fingers do not reach the latch lock of the connector, use a flat head screwdriver to push the latch to disconnect the cable. If you forcibly insert your fingers into the service clearance, the LAN port of the motherboard unit of PCI Express (PCIe) cards may be damaged.

---



# Hardware Overview

---

This chapter explains the names of components and also explains the LEDs on the operator panel and rear panel.

- [Section 2.1, “Name of Each Part” on page 2-1](#)
- [Section 2.2, “Operator Panel” on page 2-4](#)
- [Section 2.3, “LED Functions of Components” on page 2-10](#)
- [Section 2.4, “External Interface Port on Rear Panel” on page 2-12](#)
- [Section 2.5, “Labels” on page 2-16](#)

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## 2.1 Name of Each Part

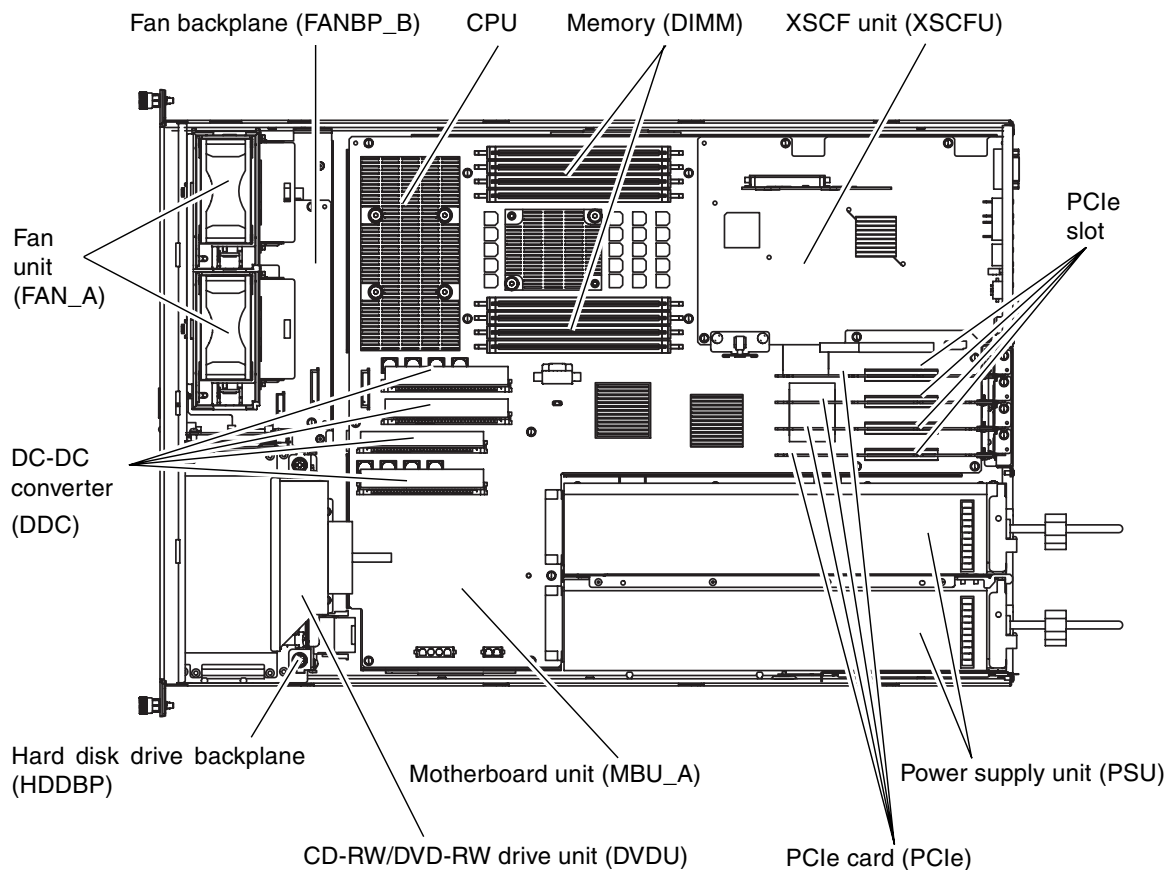
This section explains the names of parts mounted on the SPARC<sup>®</sup> Enterprise M3000 server.

Among these parts, those which can be replaced in the field by a certified field engineer are called Field Replaceable Units (FRU). For information on the actual replacement/expansion procedure for FRUs, see [Chapter 6](#) to [Chapter 15](#).

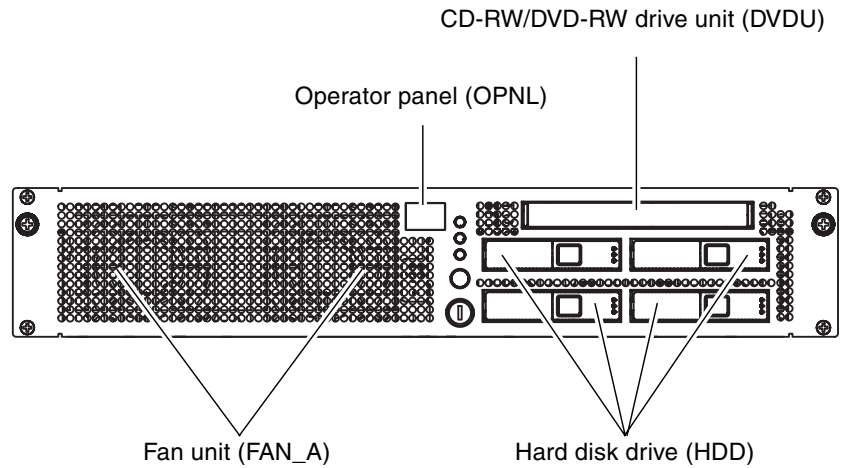
The server consists of a chassis in which various components are mounted, top cover to protect the mounted components, front panel, and rear panel. An operator panel is located on the front panel, and ports used to connect external interfaces are located on the rear panel. From the LEDs on the operator panel and rear panel, error and other status information can be checked. For details, see [Section 2.2, “Operator Panel” on page 2-4](#) to [Section 2.4, “External Interface Port on Rear Panel” on page 2-12](#).

FIGURE 2-1, FIGURE 2-2, and FIGURE 2-3 are the internal view, front view, and rear view of the server, respectively, and they indicate the names and abbreviated names of main components.

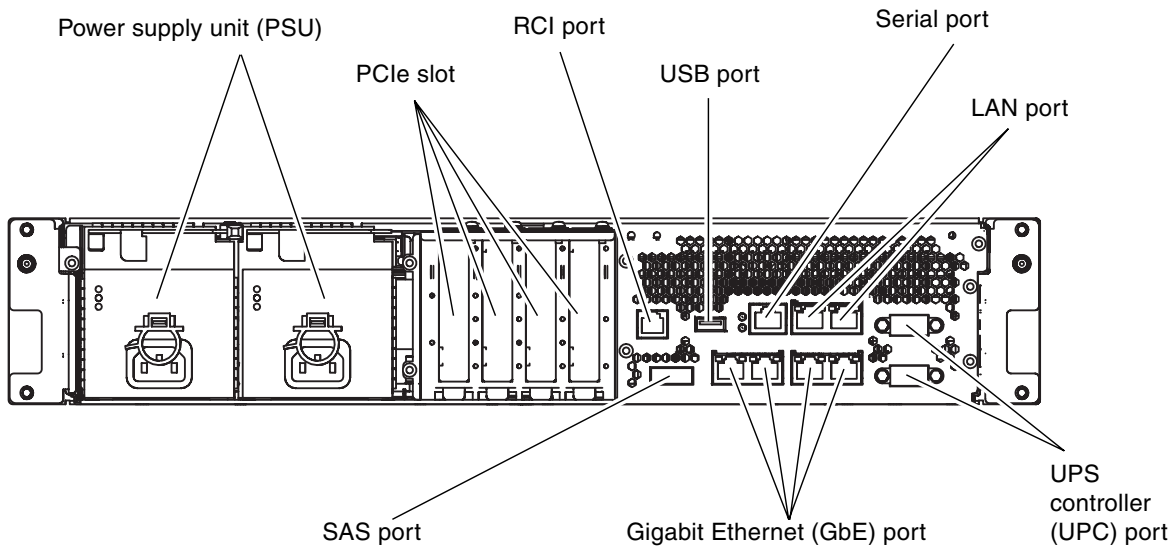
**FIGURE 2-1** Server (Internal View)



**FIGURE 2-2** Server (Front View)



**FIGURE 2-3** Server (Rear View)



---

## 2.2 Operator Panel

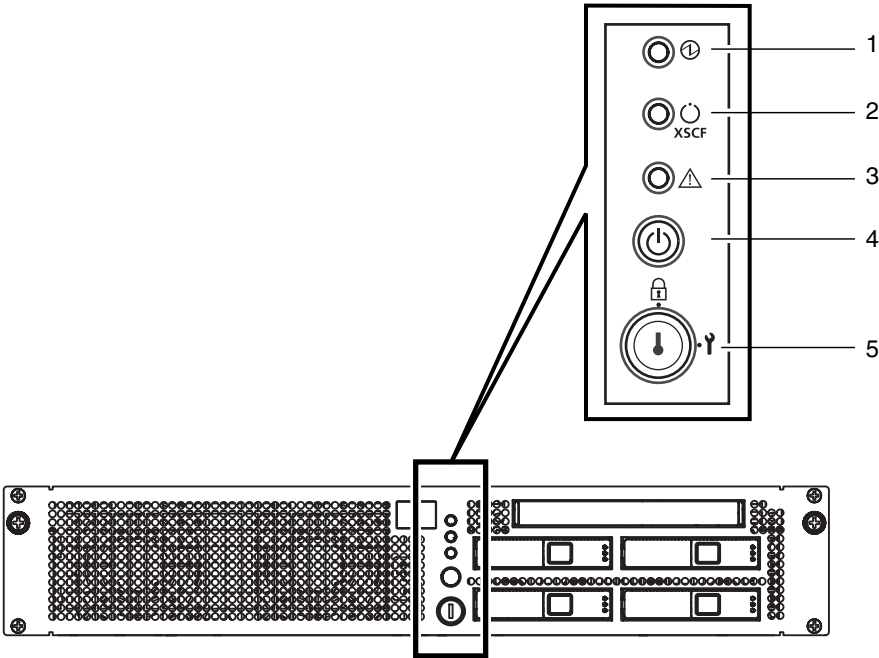
The operator panel has the important function of controlling the power of the server. The operator panel is usually locked with a key to prevent the server from being mistakenly powered off during system operation.

Before starting maintenance work, ask the system administrator to unlock the operator panel.

# 2.2.1 Operator Panel Overview

The system administrator or service engineer checks the operating status of the server with LEDs or operates the power supply with the power switch. [FIGURE 2-4](#) shows the location of the operator panel.

**FIGURE 2-4** Operator Panel Location







Location number	Component
1	POWER LED
2	XSCF STANDBY LED
3	CHECK LED
4	Power button
5	Mode switch (key switch)

# 2.2.2 Switches on the Operator Panel

TABLE 2-1 depicts the functions of the switches on the operator panel.

The switches on the operator panel include the mode switch for setting the operation mode and the power switch for turning on and off the server.

TABLE 2-1 Switches (Operator Panel)

Switch	Name	Description of function
	Mode Switch	This switch is used to set the operation mode for the server. Insert the special key that is under the customer's control, to switch between modes.
	 Locked	Normal operation mode <ul style="list-style-type: none"><li>• The system can be powered on with the power button, but it cannot be powered off with the power button.</li><li>• The key can be pulled out at this key position.</li></ul>
	 Service	Mode for maintenance <ul style="list-style-type: none"><li>• The system can be powered on and off with the power button.</li><li>• The key cannot be pulled out at this key position.</li><li>• To stop and maintain the server, set the mode to Service.</li></ul> Because remote power control and automatic power control for the server can be disabled in Service mode, unintended power-on during maintenance can be prevented.
	Power button	Used to control the server power. Power on and power off are controlled by pressing this button in different patterns, as described below.
	Holding down the button for a short time (less than 4 seconds)	Regardless of the mode switch setting, the server is powered on. At this time, processing for waiting for facility (air conditioners) power on and warm-up completion, if set in the XSCF, is skipped. *
	Holding down the button for a long time in Service mode (4 seconds or longer)	<ul style="list-style-type: none"><li>• If power to the server is on, OS shutdown processing is executed for all domains before the system is powered off.</li><li>• If the server is being powered on, the power-on processing is cancelled, and the server is powered off.</li><li>• If the server is being powered off, the operation of the power button is ignored, and the power-off processing is continued.</li></ul>

\* In normal operation, the server is powered on only when the computer room environmental conditions satisfy the specified values. Then, the server remains in the reset state until the operating system is booted.



TABLE 2-2 shows the function of the mode switch.

TABLE 2-2 Mode Switch Function

Function	Mode switch	
	Locked	Service
Break signal reception	Enabled Reception of the Break signal can be enabled or disabled for each domain using <code>setdomainmode</code> .	Disabled
Power On/Off by power button	Only Power On is enabled (auto boot).	Enabled
Power On/Off by automatic power control	Powered on or off	Not powered on or off

## 2.2.3 LEDs on the Operator Panel

TABLE 2-3 lists the server states displayed with the LEDs on the operator panel.




The three LED indicators on the operator panel indicate the following:

- General system status
- System error warning
- System error location

Besides the states listed in TABLE 2-3, the operator panel also displays various states of the server using combinations of the three LEDs. TABLE 2-4 indicates the states that are displayed in the course of operation from power-on to power-off of the server.




The blinking interval is 1 second (1 Hz).

TABLE 2-3 LEDs on the Operator Panel

Icon	Name	Color	Description
	POWER LED	Green	Indicates the server power status. <ul style="list-style-type: none"><li>• On: The power to the server is on.</li><li>• Off: The power to the server is off.</li><li>• Blinking: The server is powered off.</li></ul>
 XSCF LED	XSCF STANDBY LED	Green	Indicates the XSCF unit status. <ul style="list-style-type: none"><li>• On: XSCF unit is functioning normally.</li><li>• Off: XSCF unit is stopped.</li><li>• Blinking: System initialization is in progress after AC power was turned on.</li></ul>
	CHECK LED	Amber	Indicates that the server has detected an error. This is sometimes called a locator. <ul style="list-style-type: none"><li>• On: An error that hinders startup was detected.</li><li>• Off: Normal, or AC power is not being supplied.</li><li>• Blinking: Indicates that the unit is a maintenance target.</li></ul>

In service mode, break signals can be suppressed. If the key position is switched to Service, the server will boot into service mode the next time it reboots. Service is selected by default at the initial power-on.

**TABLE 2-4** State Display by Combination of LEDs on the Operator Panel

Name			Description
POWER *	XSCF STANDBY	CHECK	
	 XSCF		
Off	Off	Off	AC power is not being supplied.
Off	Off	On	AC power has been turned on.
Off	Blinking	Off	The XSCF unit is being initialized.
Off	Blinking	On	An error occurred in the XSCF unit.
Off	On	Off	The XSCF unit is in the standby state. The server is waiting for power-on of the air conditioning facilities in the computer room.
On	On	Off	Warm-up standby processing is in progress (power is turned on after the end of processing). The power-on sequence is in progress. The server is in operation.
Blinking	On	Off	The power-off sequence is in progress. (The fan units are stopped after the end of processing.)

\* READY LED is referred to when the XSCF unit status is indicated.

## 2.3 LED Functions of Components

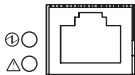


This section explains the LEDs of each component. When replacing a FRU, check in advance the states of LEDs.

Normal system state can be confirmed by checking the operator panel. If an error occurs in an individual hardware component in the server, the LEDs of the FRU containing the hardware component which caused the error will indicate the error location. However, some FRUs such as DIMMs do not have LEDs.




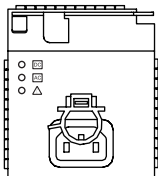

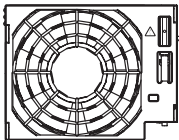

To check the state of a FRU that has no LEDs, use an XSCF shell command such as `showhardconf` in the maintenance terminal. For details, see [TABLE 3-1](#).

[TABLE 2-5](#) describes the component LEDs and their functions.

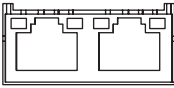
**TABLE 2-5** Component LEDs and Their Functions

Component	Name	Color	Description
Motherboard unit (MBU) 	POWER 		Indicates whether the MBU is operating.
		On (green)	Indicates that the motherboard is operating. The motherboard cannot be removed from the server while the POWER LED is on.
		Blinking (green)	Indicates that the MBU is being incorporated into the system or being disconnected from the system.
		Off	Indicates that the MBU is stopped. The MBU can be disconnected and replaced.
	CHECK 		Indicates the motherboard unit status.
		On (amber)	Indicates that an error occurred in the MBU.
	Off	Indicates that the MBU is in the normal state.	

**TABLE 2-5** Component LEDs and Their Functions (*Continued*)

Component	Name	Color	Description
Hard disk drive (HDD) 			Indicates that the hard disk drive can be removed. However, this LED is not used.
		CHECK	Indicates that an error occurred in the HDD. However, this LED stays on for several minutes (until initialization starts) immediately after power-on. This state does not indicate an error.
		Blinking (amber)	Indicates that an error requiring the replacement of the HDD occurred.
		Off	Indicates that the HDD is in the normal state.
		READY	Indicates that the HDD is operating. The HDD cannot be removed (cannot be replaced).
		OK	Indicates that the HDD is performing communication. The HDD cannot be removed (cannot be replaced).
		Off	The HDD can be replaced.
Power supply unit (PSU) 	DC	On (green)	Indicates that power is turned on and being supplied.
		DC	
	AC	On (green)	Indicates that power is being supplied to the power supply unit but the power to the server has not been turned on.
		AC	Indicates that power is not being supplied to the PSU.
		CHECK	Indicates that an error occurred in the PSU.
		Blinking (amber)	Indicates that an error requiring the replacement of the power supply unit occurred.
		Off	Indicates that the PSU is in the normal state.
Fan unit (FAN_A) 		CHECK	Indicates that an error occurred in the fan unit.
		Blinking (amber)	Indicates that an error requiring the replacement of the fan unit occurred.
		Off	Indicates that the fan unit is in the normal state.

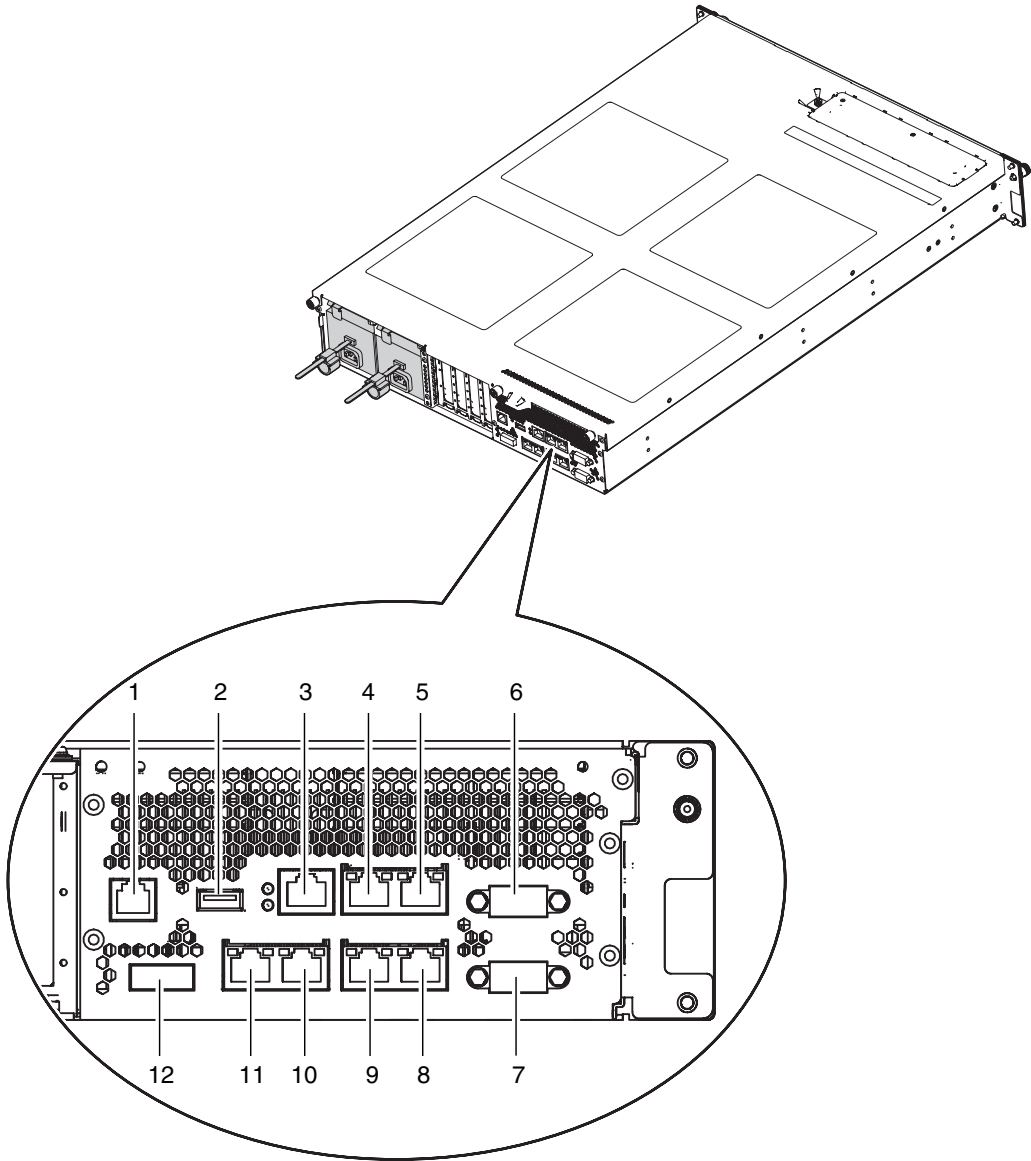
**TABLE 2-5** Component LEDs and Their Functions (*Continued*)

Component	Name	Color	Description
LAN port display part 	ACTIVE	On (green)	Indicates that communication is being performed through the LAN port.
		Off	Indicates that communication is not being performed through the LAN port.
	LINK SPEED	On (amber)	Indicates that the communication speed of the LAN port is 1 Gbps.
		On (green)	Indicates that the communication speed of the LAN port is 100 Mbps.
		Off	Indicates that the communication speed of the LAN port is 10 Mbps.



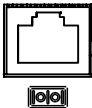


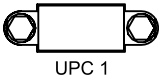
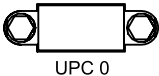
## 2.4 External Interface Port on Rear Panel

This section shows the location of the external interface ports located on the server rear panel and explains their functions.

**FIGURE 2-5** External Interface Port Locations








**TABLE 2-6** External Interface Port Functions

Location number	Component		Description
1	RCI port	 RCI	Used to connect the server to a peripheral device having a PCI connector to enable power interlocking and error monitoring.
2	USB port (for XSCF)		Exclusive for maintenance personnel. Cannot be connected to general-purpose USB devices.
3	Serial port (for XSCF)		Connects to the XSCF unit through serial connection to set up and manage the server.
4	LAN port 1 (for XSCF)	 LAN 1	Accommodates a 100Base-TX LAN cable to set up the server and display status. <ul style="list-style-type: none"><li>• XSCF shell (command-line interface: CLI):</li><li>• XSCF Web (browser user interface: BUI):</li></ul>
5	LAN port 0 (for XSCF)	 LAN 0	Through CLI or BUI, the user or system administrator monitors the server, displays status, operates domains, and displays information on the console.
6	UPC port 1	 UPC 1	By connecting an uninterruptible power supply (UPS) unit that has the UPS controller (UPC) interface, stable power supply is provided in the event of a failure in the power supply or even a large-scale power failure. If a single power feed is used, connect a UPS cable to UPC port 0. In a dual power feed, connect UPS cables to UPC ports 0 and 1.
7	UPC port 0	 UPC 0	



**TABLE 2-6** External Interface Port Functions *(Continued)*

Location number	Component		Description
8	GbE port 0 (for OS)	 GLAN 0	Up to 4 100Base-TX/1000Base-T cables can be connected to GbE ports. High-capacity data can be transferred at a high speed.
9	GbE port 1 (for OS)	 GLAN 1	
10	GbE port 2 (for OS)	 GLAN 2	
11	GbE port 3 (for OS)	 GLAN 3	
12	SAS port		Accommodates external Serial Attached SCSI (SAS) devices such as a tape drive.

---

## 2.5 Labels

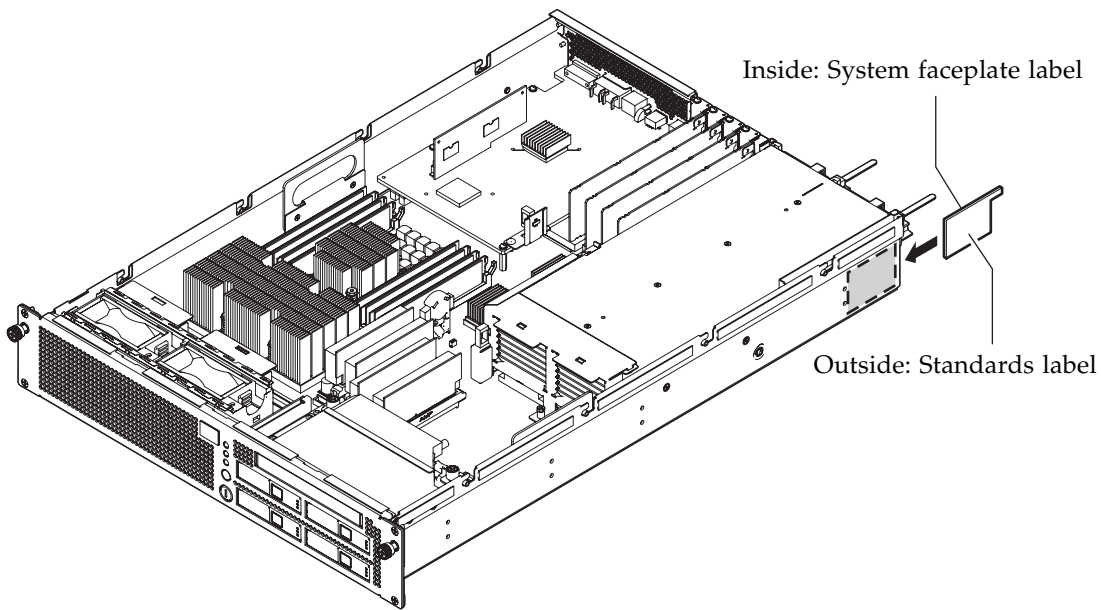
This section explains the labels affixed to the server.

A label-affixed card that can be inserted or extracted is provided near the power supply unit at the right side at the rear of the server (see [TABLE 2-6](#)). The information on the label might differ from that shown on the affixed labels.

- The model number, serial number, and hardware version, all of which are required for maintenance and management, are shown on the system faceplate label.
- The standards label is affixed close to the system faceplate label and shows the approval standards.
  - Safety: NRTL/C
  - Radio wave: VCCI-A, FCC-A, DOC-A, MIC
  - Safety and radio wave: CE

The card should be inserted in such a way that the standards label faces the outside of the server and the system faceplate label faces the inside of the server.

**FIGURE 2-6** Label Locations



# Troubleshooting

---

This chapter provides fault diagnosis information.

- [Section 3.1, “Emergency Power Off” on page 3-1](#)
- [Section 3.2, “Failure Diagnostic Method” on page 3-2](#)
- [Section 3.3, “Checking the Server and System Configuration” on page 3-4](#)
- [Section 3.4, “Error Conditions” on page 3-7](#)
- [Section 3.5, “Using Troubleshooting Commands” on page 3-10](#)
- [Section 3.6, “General Solaris Troubleshooting Commands” on page 3-17](#)

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## 3.1 Emergency Power Off

This section explains how to power off in an emergency.



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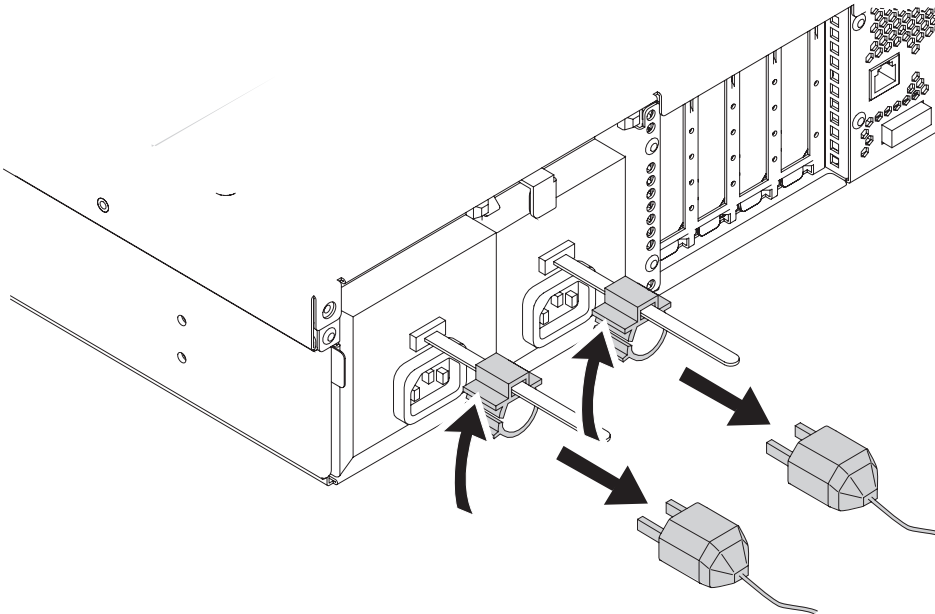
**Caution** – In an emergency (such as smoke or flames coming from the server), immediately stop using the server and turn off the power supply. Regardless of the type of business, give top priority to fire prevention measures.

---

1. Press the power switch for more than 4 seconds to power off the server.

2. Remove the AC power cord clamp and disconnect the cable.

**FIGURE 3-1** Power-off Method

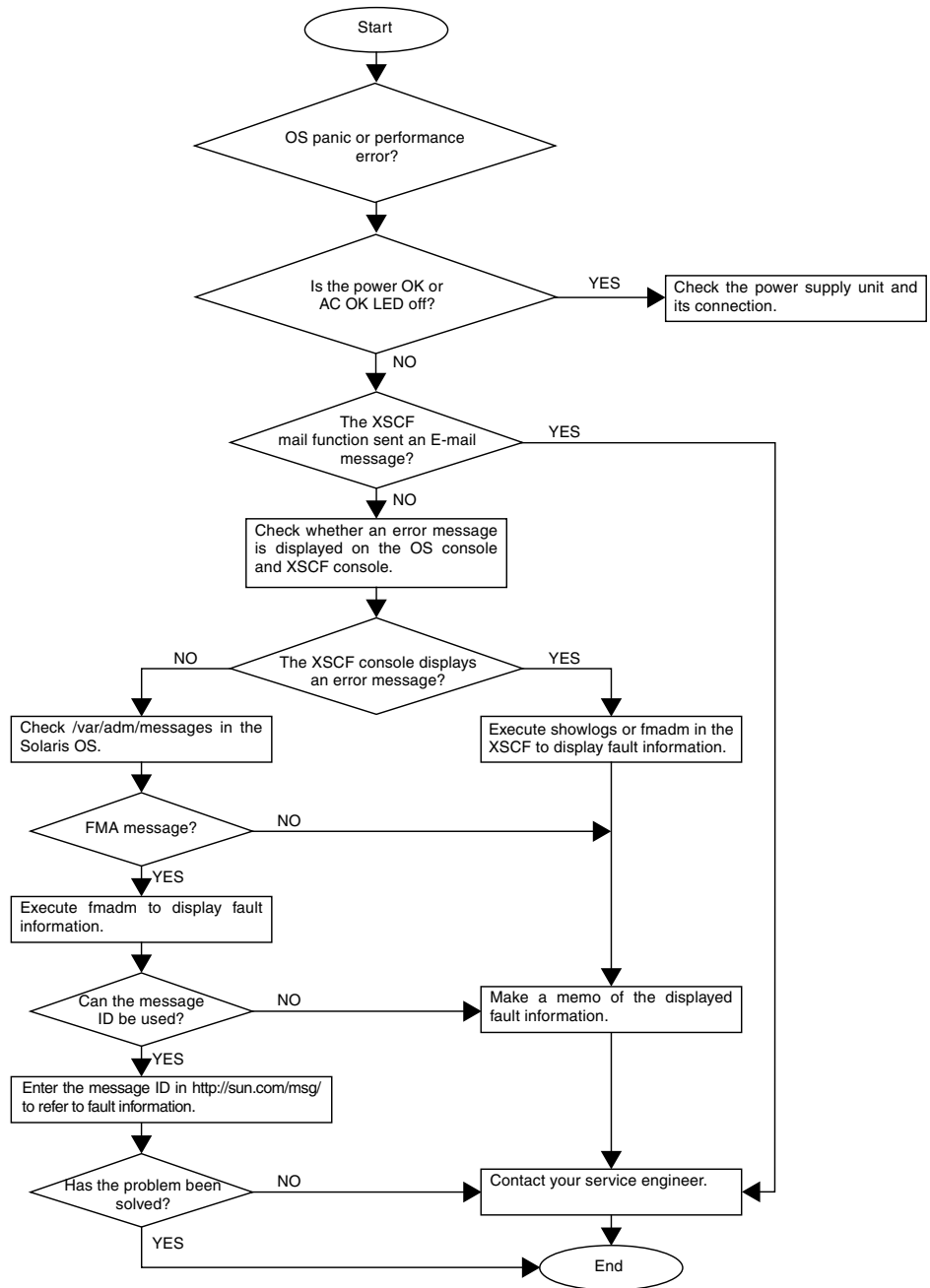


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## 3.2 Failure Diagnostic Method

When an error occurs, a message is displayed on the maintenance monitor in many cases. Use the flowchart in [FIGURE 3-2](#) to find the correct methods for diagnosing failures.

**FIGURE 3-2** Diagnostic Method Flowchart



---

## 3.3 Checking the Server and System Configuration

The operating conditions must remain the same before and after maintenance. If an error occurs in the server, save the system configuration and component status information. Confirm that the recovered state after maintenance is the same as that before maintenance.

If an error occurs in the server, one of the following messages is displayed.

- Solaris™ Operating System message file
- XSCF shell `showhardconf(8)` command and `showstatus(8)` command
- Management console
- Service processor log

### 3.3.1 Checking the Hardware Configuration and FRU Status

To replace a faulty FRU and perform the maintenance on the server, it is important to check and understand the hardware configuration of the server and the state of each hardware component.

The hardware configuration refers to information that indicates to which layer a hardware component belongs.

The status of each hardware component refers to information on the conditions of a standard or optional component in the server: temperature, power supply voltage, CPU operating conditions, and other status information.

To check the hardware configuration and the status of each hardware component, use XSCF shell commands from the maintenance terminal. See [TABLE 3-1](#) for the commands used.

**TABLE 3-1** Commands for Checking Hardware Configuration

Command	Description
<code>showhardconf</code>	Displays hardware configuration.
<code>showstatus</code>	Displays the status of a component. This command is used only when a faulty component is checked.

**TABLE 3-1**    Commands for Checking Hardware Configuration (*Continued*)

Command	Description
showboards	Displays information on the system board (XSB).
showdcl	Displays the hardware resource configuration information of a domain.
showfru	Displays the setting information of a device.

The status of each component can be checked based on the On or blinking state of the component LEDs.

For the component types and LED states, see [TABLE 2-3](#) and [TABLE 2-5](#).

For details of commands, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide* and the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF Reference Manual*.

### 3.3.1.1    Checking the Hardware Configuration.

To check the hardware configuration, authority (user authority) to log in with the XSCF user account to the XSCF is required. The following procedure can be used to check the hardware configuration from the maintenance terminal.

Ask the system administrator for the required information, such as the user account and password. For details, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

1. **Log in to XSCF shell.**
2. **Type** showhardconf.

XSCF> **showhardconf**

The showhardconf command displays hardware configuration information. For details, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

### 3.3.2    Checking the Software and Firmware Configurations

The software and firmware configurations and versions affect the operation of the server. To change a configuration or investigate a problem, check the latest information and check for any problems in the software.

Because the types and versions of installed software and firmware vary depending on the system, they need to be checked.

- The software configuration and the version can be checked in the Solaris OS. For details, see documents of the Solaris OS.

To check software and firmware configuration information, you can use the commands listed in [TABLE 3-2](#) from the maintenance terminal if you are granted user authority by the system administrator.

To check the firmware configuration and version, use XSCF shell commands from the maintenance terminal.

**TABLE 3-2** Commands for Checking the Software and Firmware Configurations

Command	Description
showrev	Displays system configuration information and Solaris OS patch information.
uname	Outputs current system information.
version	Outputs current firmware version information.
showhardconf	Outputs information on the components mounted on the server.
showstatus	Displays the status of a component. This command is used only when a faulty component is checked.
showboards	Displays XSB information. It can display information on an XSB that belongs to the specified domain and information on all XSBs mounted. An XSB combines hardware resources on physical system boards. The M3000 server consists of a single physical system board (Uni-XSB).
showdcl	Displays the configuration information of a domain (hardware resource information).
showfru	Displays the setting information of a device.

For details, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

### 3.3.2.1 Checking the Software Configuration

The following procedure can be used to check the software configuration from the domain console.

- **Type** showrev.

```
# showrev
```

The showrev command displays system configuration information on the screen.



### 3.3.2.2 Checking the Firmware Configuration

User authority is required to check the firmware configuration. The procedure below can be used to check the configuration from the maintenance terminal.

1. **Log in to XSCF shell.**
2. **Type** `version`.

```
XSCF> version
```

The `version` command displays firmware version information on the screen. For details, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

### 3.3.2.3 Downloading Error Log Information

To download error log information, use the XSCF log fetch function. The XSCF unit has an interface with external units so that the service engineer can easily obtain useful maintenance information such as error logs.

Connect the maintenance terminal, and use the XSCF shell or XSCF Web to download error log information to the maintenance terminal.

---

## 3.4 Error Conditions

To interpret error information of the Solaris OS and obtain information on fault management architecture (FMA) messages, access the following web site:

<http://www.sun.com/msg>

In addition, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide* to obtain more information on faults.

This web site can be used in the event of a Solaris OS error or domain error or to look up specific FMA error messages that do not provide details on XSCF errors.

This web site provides the message ID displayed by software, technical information on the error, and corrective action for the error. Information on errors and documentation are updated regularly.

Predictive self-healing is an architecture and methodology for automatically diagnosing, reporting, and handling software and hardware error conditions. This new technology reduces the time required to debug a hardware or software problem and provides the administrator and service engineer with detailed data about each error.

### 3.4.1 Predictive Self-Healing Tools

In the Solaris OS, Solaris Fault Manager runs in the background. When an error occurs, the system software recognizes the error and attempts to determine the faulty hardware component. The system software also takes steps to prevent the faulty component from being used until it has been replaced. The system software performs the following activities:

- Receives telemetry information about errors detected by the system software.
- Diagnoses the errors.
- Initiates predictive self-healing activities. For example, Solaris Fault Manager can disable faulty components.
- When possible, causes the faulty FRU to provide an LED indication of the error in addition to populating system console messages with more details.

TABLE 3-3 shows typical messages generated when an error occurs. Messages are displayed on your console and are recorded in the `/var/adm/messages` file.

A message in TABLE 3-3 indicates that the fault has already been diagnosed. If there was any corrective action that the system could take, the system has already taken it. If your server is still running, the corrective action continues to be taken.

TABLE 3-3 Predictive Self-Healing Messages

Output displayed	Description
Nov 1 16:30:20 dt88-292 EVENT-TIME:Tue Nov 1 16:30:20 PST 2005	EVENT-TIME: The time stamp of the diagnosis
Nov 1 16:30:20 dt88-292 PLATFORM:SUNW,A70, CSN:-, HOSTNAME:dt88-292	PLATFORM: A description of the server encountering the error
Nov 1 16:30:20 dt88-292 SOURCE:eft, REV: 1.13	SOURCE: Information on the Diagnosis Engine used to determine the error
Nov 1 16:30:20 dt88-292 EVENT-ID:afc7e660-d609-4b2f-86b8-ae7c6b8d50c4	EVENT-ID: The Universally Unique event ID for this error
Nov 1 16:30:20 dt88-292 DESC: Nov 1 16:30:20 dt88-292 A problem was detected in the PCI Express subsystem	DESC: A basic description of the error

**TABLE 3-3** Predictive Self-Healing Messages (*Continued*)

Output displayed	Description
Nov 1 16:30:20 dt88-292 Refer to <a href="http://sun.com/msg/SUN4-8000-0Y">http://sun.com/msg/SUN4-8000-0Y</a> for more information.	WEB SITE: Where to find specific information and actions for this error
Nov 1 16:30:20 dt88-292 AUTO-RESPONSE:One or more device instances may be disabled.	AUTO-RESPONSE: What, if anything, the system did to alleviate any follow-on problems
Nov 1 16:30:20 dt88-292 IMPACT:Loss of services provided by the device instances associated with this fault.	IMPACT: A description of what is considered to be the impact of the fault
Nov 1 16:30:20 dt88-292 REC-ACTION:Schedule a repair procedure to replace the affected device.Use Nov 1 16:30:20 dt88-292 fmdump -v -u EVENT_ID to identify the device or contact Sun for support.	REC-ACTION: A brief description of the corrective action the system administrator should take

## 3.4.2 Monitoring Output

To understand error conditions, collect monitoring output information. For the collection of the information, use the commands shown in [TABLE 3-4](#).

**TABLE 3-4** XSCF Commands for Checking Monitoring Output

Command	Operand	Description
showlogs (XSCF command)	console	Displays the console of a domain.
	monitor	Logs messages that are displayed in the message window.
	panic	Logs output to the console during a panic.
	ipl	Collects console data generated during the period of the power-on of a domain to the completion of the Solaris OS start.

# 3.4.3 Messaging Output

To understand error conditions, collect messaging output information. For the collection of the information, use the commands shown in [TABLE 3-5](#).

**TABLE 3-5** Commands for Checking Messaging Output

Command	Operand	Description
showlogs (XSCF command)	env	Displays the temperature history log. The environmental temperature data and power status are indicated in 10-minute intervals. The data is stored for a maximum of six months.
	power	Displays power and reset information.
	event	Displays information reported to the system and stored it as event logs.
	error	Displays error logs.
fmdump (Solaris OS command)		Displays FMA diagnostic results and errors. This command is provided as a Solaris OS command and XSCF shell command.

Each error message logged by the predictive self-healing architecture has a message ID and Web address associated with the message. From this message ID and Web address, information on the most up-to-date corrective measures can be retrieved.

For details of predictive self-healing, see the Solaris OS documents.



# 3.5 Using Troubleshooting Commands

When any message listed in [TABLE 3-3](#) is displayed, detailed information on the error may be required. For details on troubleshooting commands, see manual pages of the Solaris OS or XSCF shell. This section provides detailed explanations of the following commands:

- [“Using the showhardconf Command” on page 3-11](#)
- [“Using the showlogs Command” on page 3-12](#)
- [“Using the showstatus Command” on page 3-13](#)
- [“Using the fmdump Command” on page 3-14](#)
- [“Using the fmdump Command” on page 3-14](#)
- [“Using the fmstat Command” on page 3-17](#)

## 3.5.1 Using the showhardconf Command

The showhardconf command displays information on each FRU. The following information is displayed:

- Current configuration and status
- Number of mounted units
- Domain information
- Name properties of the PCIe card

```
XSCF> showhardconf
SPARC Enterprise M3000;
+ Serial:IKK0813023; Operator_Panel_Switch:Locked;
+ Power_Supply_System:Single; SCF-ID:XSCF#0;
+ System_Power:On; System_Phase:Cabinet Power On;
Domain#0 Domain_Status:OpenBoot Execution Completed;

MBU_A Status:Normal; Ver:0101h; Serial:PP0829045F ;
+ FRU-Part-Number:CA07082-D902 A1 /541-3302-01 ;
+ CPU Status:Normal;
+ Freq:2.520 GHz; Type:32;
+ Core:4; Strand:2;
+ Memory_Size:8 GB;
MEM#0A Status:Normal;
+ Code:ce000000000000001M3 93T2950EZA-CE6 4145-473b3c23;
+ Type:1A; Size:1 GB;
MEM#0B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2918;
+ Type:1A; Size:1 GB;
MEM#1A Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b28af;
+ Type:1A; Size:1 GB;
MEM#1B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b28ab;
+ Type:1A; Size:1 GB;
MEM#2A Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b283e;
+ Type:1A; Size:1 GB;
MEM#2B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2829;
+ Type:1A; Size:1 GB;
MEM#3A Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2840;
+ Type:1A; Size:1 GB;
MEM#3B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2830;
+ Type:1A; Size:1 GB;
```

The showhardconf output continued:

```
PCI#0 Name_Property:fibre-channel; Card_Type:Other;
PCI#1 Name_Property:fibre-channel; Card_Type:Other;
PCI#2 Name_Property:pci; Card_Type:Other;
PCI#3 Name_Property:pci; Card_Type:Other;
OPNL Status:Normal; Ver:0101h; Serial:PP0829045Y ;
+ FRU-Part-Number:CA07082-D912 A0 /541-3306-01 ;
PSU#0 Status:Normal; Serial:EA08260208;
+ FRU-Part-Number:CA01022-0720 03C /300-2193-03 ;
+ Power_Status:On;
PSU#1 Status:Normal; Serial:EA08260210;
+ FRU-Part-Number:CA01022-0720 03C /300-2193-03 ;
+ Power_Status:On;
FANBP_B Status:Normal; Ver:0101h; Serial:PP082704TD ;
+ FRU-Part-Number:CA20399-B12X 006AB/541-3304-02 ;
FAN_A#0 Status:Normal;
FAN_A#1 Status:Normal;
```

For details, see the showhardconf manual pages.

## 3.5.2 Using the showlogs Command

The showlogs command displays information of specified logs in the order of time stamps. The information with the oldest time stamp is displayed first. The showlogs command displays the following logs:

- Error log
- Power log
- Event log
- Temperature and humidity record
- Monitoring message log
- Console message log
- Panic message log
- IPL message log

```

XSCF> showlogs error
Date: Jun 17 11:05:32 JST 2008      Code: 80000000-c3ff0000-0173000600000000
  Status: Alarm                    Occurred: Jun 17 11:05:32.522 JST 2008
  FRU: /PSU#1
  Msg: PSU shortage
Date: Jun 17 13:41:46 JST 2008      Code: 80002080-7801c201-0130000000000000
  Status: Alarm                    Occurred: Jun 17 13:41:44.861 JST 2008
  FRU: /MBU_A,*
  Msg: Board control error (MBC link error)
Date: Jun 17 13:46:31 JST 2008      Code: 60000000-cd01c701-0164010100000000
  Status: Warning                  Occurred: Jun 17 13:46:31.158 JST 2008
  FRU: /OPNL,/FANBP_B
  Msg: TWI access error
XSCF>

```

### 3.5.3 Using the showstatus Command

The `showstatus` command displays information about faulty or degraded units that are among the FRUs composing the server and information on the units on the layers immediately above the layers of the faulty or degraded units. For each of the displayed units, an asterisk (\*) indicating that the unit is faulty is displayed with any of the following status indicators, which is displayed after "Status:".

- Normal: Normal state
- Faulted: The unit is faulty and is not operating.
- Degraded: The unit is operating. The unit is partly faulty or degraded and some error has been detected. Although a faulty state is displayed for the unit, it is operating normally.
- Deconfigured: There is no problem with the unit itself, but it is degraded due to a configuration problem, environmental problem, or the degradation of another unit.
- Maintenance: Maintenance is being performed. `replacefru(8)` or `addfru(8)` is being executed.

```

XSCF> showstatus
      FANBP_B Status:Normal;
*      FAN_A#0 Status:Faulted;
XSCF>

```

## 3.5.4 Using the fmdump Command

The `fmdump` command displays the contents of the log managed by the module called Fault Manager.

This example assumes that only one error exists.

```
# fmdump
TIME                               UUID                               SUNW-MSG-ID
Nov 02 10:04:15.4911 0ee65618-2218-4997-c0dc-b5c410ed8ec2 SUN4-8000-0Y
```

### 3.5.4.1 fmdump -V Command

To get more detailed information you can use the `-e` option, as shown in the following example.

```
# fmdump -V -u 0ee65618-2218-4997-c0dc-b5c410ed8ec2
TIME                               UUID                               SUNW-MSG-ID
Nov 02 10:04:15.4911 0ee65618-2218-4997-c0dc-b5c410ed8ec2 SUN4-8000-0Y
100% fault.io.fire.asic
FRU: hc://product-id=SUNW,A70/motherboard=0
rsrc: hc:///motherboard=0/hostbridge=0/pciexrc=0
```

The output method using the `-V` option displays at least three additional lines.

- The first line is the same information shown for console messages above, including a time stamp, UUID, and message ID.
- The second line is a declaration of the certainty of diagnosis. In this case we are 100 percent sure the failure is in the ASIC described. If the diagnosis may involve multiple components, you may see two lines here with 50% in each of the two lines.
- The "FRU" line indicates what component must be replaced to return the server to a fully operational state.
- The "rsrc" line indicates the component that has become unusable because of this error.



### 3.5.4.2 `fmddump -e` Command

To get information of the errors that caused this failure you can use the `-e` option, as shown in the following example.

```
# fmddump -e
TIME                               CLASS
Nov 02 10:04:14.3008 ereport.io.fire.jbc.mb_per
```

## 3.5.5 Using the `fmadm` Command

### 3.5.5.1 Using the `fmadm faulty` Command

The `fmadm faulty` command can be used by administrators and service personnel to view and modify system configuration parameters that are maintained by the Solaris fault manager. The command is primarily used to determine the status of a component involved in a fault, as shown in the following example:

```
# fmadm faulty
STATERESOURCE / UUID
-----
degraded dev:///pci@1e,600000
0ee65618-2218-4997-c0dc-b5c410ed8ec2
# fmadm repair
0ee65618-2218-4997-c0dc-b5c410ed8ec2
```

The PCIe slot has been degraded and it is associated with the same UUID as above. Also, the "faulted" status may be displayed.

### 3.5.5.2 fmadm repair Command

When the `fmadm faulty` command displays a fault, the `fmadm repair` command must be executed to clear the FRU information in the domain after replacement of the motherboard unit that has encountered the error. If the `fmadm repair` command is not executed, the error message is not cleared.

If the `fmadm faulty` command displays a fault, clearing the FMA resource cache on the operating system side causes no problem. Data in the cache does not need to match the hardware fault information held by the XSCF.

```
# fmadm repair
STATERESOURCE / UUID
-----
degraded dev:///pci@1e,600000
0ee65618-2218-4997-c0dc-b5c410ed8ec2
```

### 3.5.5.3 fmadm config Command

The `fmadm config` command output displays the version number and current status of the diagnosis engine that is being used by the server. Whether the latest engine is being used can be determined by consulting the SunSolve web site.

```
# fmadm config
```

MODULE	VERSION	STATUS	DESCRIPTION
cpumem-diagnosis	1.6	active	CPU/Memory Diagnosis
cpumem-retire	1.1	active	CPU/Memory Retire Agent
disk-transport	1.0	active	Disk Transport Agent
eft	1.16	active	eft diagnosis engine
event-transport	2.0	active	Event Transport Module
fabric-xlate	1.0	active	Fabric Ereport Translator
fmd-self-diagnosis	1.0	active	Fault Manager Self-Diagnosis
io-retire	1.0	active	I/O Retire Agent
snmp-trapgen	1.0	active	SNMP Trap Generation Agent
sysevent-transport	1.0	active	SysEvent Transport Agent
syslog-msgs	1.0	active	Syslog Messaging Agent
zfs-diagnosis	1.0	active	ZFS Diagnosis Engine
zfs-retire	1.0	active	ZFS Retire Agent

## 3.5.6 Using the `fmstat` Command

The `fmstat` command reports statistical information and a set of modules that are associated with the module called Solaris Fault Manager. By using the `fmstat` command, statistical information about the diagnostic engine and diagnostic agent that are currently involved in fault management can be displayed.

The following output example shows that the `fmd-self-diagnosis` DE module (displayed also on the console output) has received accepted events.

#	<b>fmstat</b>										
module	ev_rcv	ev_acpt	wait	svc_t	%w	%b	open	solve	memsz	bufsz	
cpumem-diagnosis	0	0	0.0	0.0	0	0	0	0	3.0K	0	
cpumem-retire	0	0	0.0	0.0	0	0	0	0	0	0	
disk-transport	0	0	0.0	1793.8	0	0	0	0	40b	0	
eft	0	0	0.0	0.0	0	0	0	0	1.2M	0	
event-transport	0	0	0.0	0.0	0	0	0	0	210b	0	
fabric-xlate	0	0	0.0	0.0	0	0	0	0	0	0	
fmd-self-diagnosis	0	0	0.0	0.0	0	0	0	0	0	0	
io-retire	0	0	0.0	0.0	0	0	0	0	0	0	
snmp-trapgen	0	0	0.0	0.0	0	0	0	0	32b	0	
sysevent-transport	0	0	0.0	2395.3	0	0	0	0	0	0	
syslog-msgs	0	0	0.0	0.0	0	0	0	0	0	0	
zfs-diagnosis	0	0	0.0	0.0	0	0	0	0	0	0	
zfs-retire	0	0	0.0	0.0	0	0	0	0	0	0	

---

## 3.6 General Solaris Troubleshooting Commands

Superuser commands of this type are useful to determine whether there is a problem with the server, network, or another server connected via the network.

This section explains the following commands:

- [“Using the `iostat` Command” on page 3-18](#)
- [“Using the `prtdiag` Command” on page 3-19](#)
- [“Using the `prtconf` Command” on page 3-21](#)
- [“Using the `netstat` Command” on page 3-24](#)
- [“Using the `ping` Command” on page 3-25](#)
- [“Using the `ps` Command” on page 3-26](#)
- [“Using the `prstat` Command” on page 3-27](#)

Most of these commands are located in the `/usr/bin` directory or `/usr/sbin` directory.

## 3.6.1 Using the `iostat` Command

The `iostat` command repeatedly reports terminal, drive, and I/O activity, as well as CPU utilization.

### 3.6.1.1 Options

[TABLE 3-6](#) lists the options of the `iostat` command and how those options can help troubleshoot the server.

**TABLE 3-6** Options for `iostat`

Option	Description	How it can help
No option	Reports status of local I/O devices.	A quick three-line output of device status information.
-c	Reports the percentages of time the system has spent in user mode, in system mode, waiting for I/O, and idling.	Quick report of CPU status
-e	Displays device error summary statistics. Displays the total number of errors, hardware errors, software errors, and transfer errors.	Provides a short table with accumulated errors. Identifies suspect I/O devices.
-E	Displays all device error statistics.	Provides information about devices: manufacturer, model number, serial number, size, and errors.
-n	Displays names in a descriptive format.	The descriptive format helps identify devices.
-x	Reports extended drive statistics of each drive. The output is in a tabular form.	Similar to the <code>-e</code> option, but provides rate information. This helps identify internal devices with poor performance and other I/O devices with poor performance across the network.

The following example shows output for the `iostat` command:

```
# iostat -En
c0t0d0    Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Model: ST3120026A    Revision: 8.01    Serial No: 3JT4H4C2
Size: 120.03GB <120031641600 bytes>
Media Error: 0 Device Not Ready: 0    No Device: 0 Recoverable: 0
Illegal Request: 0
c0t2d0    Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: LITE-ON    Product: COMBO SOHC-4832K Revision: 03K1 Serial No:
Size: 0.00GB <0 bytes>
Media Error: 0 Device Not Ready: 0    No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
```

## 3.6.2 Using the `prtdiag` Command

The `prtdiag` command displays system configuration and diagnostic information. The diagnostic information identifies any failed FRU in the system.

The `prtdiag` command is located in the `/usr/platform/platform-name/sbin/` directory.

The `prtdiag` command may indicate a slot number different from that shown elsewhere in this document. This is normal.

### 3.6.2.1 Options

[TABLE 3-7](#) lists the options of the `prtdiag` command and how those options can help troubleshooting.

**TABLE 3-7** Options for `prtdiag`

Option	Description	How it can help
No option	Lists components.	Shows CPU timing and PCIe cards installed.
<code>-v</code>	Verbose mode. Displays the time of the most recent AC power failure, the most recent hardware fatal error information, and (if necessary) the environmental status.	Provides the same information as no option. Additionally, displays fan unit status, temperatures, and ASIC and PROM revisions.

The following example shows output for the prtdiag command in verbose mode:

```
# prtdiag -v
System Configuration: Sun Microsystems sun4u SPARC Enterprise M3000 Server
System clock frequency: 1064 MHz
Memory size: 7808 Megabytes

===== CPUs =====

      CPU          CPU      Run  L2$   CPU   CPU
  LSB  Chip      ID      MHz  MB   Impl. Mask
  ---  ---      ---      ---  ---  ---
    00    0    0, 1, 2, 3, 4, 5, 6, 7  2520  5.0    7   145

===== Memory Configuration =====

      Memory  Available      Memory  DIMM  # of  Mirror  Interleave
  LSB Group   Size      Status   Size  DIMMs Mode   Factor
  ---  ---  ---  ---  ---  ---
    00   A    4096MB    okay    1024MB   4   no    2-way
    00   B    3712MB    okay    1024MB   4   no    2-way

===== IO Devices =====

      IO
  LSB Type LPID RvID,DvID,VnID  BDF   State Act,Max  Lane/Frq  Name  Model
  Logical Path
  ---  ---  ---  ---  ---  ---  ---  ---
  -----

00 PCIe 0 aa, 8533, 10b5 2, 0, 0 okay 8, 8 pci-pciex10b5,8533
N/A /pci@0,600000/pci@0
00 PCIe 0 aa, 8533, 10b5 3, 0, 0 okay 4, 8 pci-pciex10b5,8533
N/A /pci@0,600000/pci@0/pci@0
00 PCIe 0 aa, 8533, 10b5 3, 1, 0 okay 4, 4 pci-pciex10b5,8533
N/A /pci@0,600000/pci@0/pci@1
00 PCIe 0 aa, 8533, 10b5 3, 2, 0 okay 4, 4 pci-pciex10b5,8533
N/A /pci@0,600000/pci@0/pci@2
00 PCIe 0 aa, 8533, 10b5 3, 8, 0 okay 0, 8 pci-pciex10b5,8533
N/A /pci@0,600000/pci@0/pci@8
00 PCIe 0 8, 58, 1000 4, 0, 0 okay 4, 8 scsi-pciex1000,58
LSI,1068E /pci@0,600000/pci@0/pci@0/scsi@0
00 PCIX 0 b5, 103, 1166 5, 0, 0 okay 133,133 pci-pciex1166,103
N/A /pci@0,600000/pci@0/pci@1/pci@0
00 PCI 0 a3, 1678, 14e4 6, 4, 0 okay --,133 network-pci14e4,1678
N/A /pci@0,600000/pci@0/pci@1/pci@0/network@4
```

The prtdiag output continued:

```
00 PCI 0 a3, 1678, 14e4 6, 4, 1 okay --,133 network-pci14e4,1678
N/A /pci@0,600000/pci@0/pci@1/pci@0/network@4,1
00 PCIx 0 b5, 103, 1166 7, 0, 0 okay 133,133 pci-pciex1166,103
N/A /pci@0,600000/pci@0/pci@2/pci@0
00 PCI 0 a3, 1678, 14e4 8, 4, 0 okay --,133 network-pci14e4,1678
N/A /pci@0,600000/pci@0/pci@2/pci@0/network@4
00 PCI 0 a3, 1678, 14e4 8, 4, 1 okay --,133 network-pci14e4,1678
N/A /pci@0,600000/pci@0/pci@2/pci@0/network@4,1
00 PCIE 1 aa, 8533, 10b5 2, 0, 0 okay 8, 8 pci-pciex10b5,8533
N/A /pci@1,700000/pci@0
00 PCIE 1 aa, 8533, 10b5 3, 0, 0 okay 0, 8 pci-pciex10b5,8533
N/A /pci@1,700000/pci@0/pci@0
00 PCIE 1 aa, 8533, 10b5 3, 8, 0 okay 0, 8 pci-pciex10b5,8533
N/A /pci@1,700000/pci@0/pci@8
00 PCIE 1 aa, 8533, 10b5 3, 9, 0 okay 0, 8 pci-pciex10b5,8533
N/A /pci@1,700000/pci@0/pci@9
===== Hardware Revisions =====

System PROM revisions:
-----

OBP 4.24.8 2008/04/23 15:15

===== Environmental Status =====

Mode switch is in LOCK mode

===== System Processor Mode =====

SPARC64-VII mode

#
```

### 3.6.3 Using the prtconf Command

Similar to the show-devs command executed at the ok prompt, the prtconf command displays the devices that are configured.

The prtconf command identifies hardware that is recognized by the Solaris OS. If software applications are having problems with hardware but the hardware is not suspected of being faulty, the prtconf command can be used to check whether the Solaris software recognizes the hardware and whether a driver for the hardware is loaded.

### 3.6.3.1 Options

TABLE 3-8 lists the options of the `prtconf` command and how those options can help troubleshooting.

**TABLE 3-8** Options for `prtconf`

Option	Description	How it can help
No option	Displays the device tree of devices recognized by the operating system.	If a hardware device is recognized, then it is considered to be functioning properly. If the message "(driver not attached)" is displayed for the device or sub-device, then the driver for the device is corrupt or missing.
-D	Similar to the output of no option, but device driver names are listed.	Lists the drivers needed or used by the operating system to enable the device.
-p	Similar to the output of no option, yet is abbreviated.	Provides a brief list of the devices.
-V	Displays the version and date of the OpenBoot™ PROM firmware.	Useful for a quick check of the firmware version.

The following example shows output for the `prtconf` command:

```
# prtconf
System Configuration:  Sun Microsystems  sun4u
Memory size: 7616 Megabytes
System Peripherals (Software Nodes):

SUNW,SPARC-Enterprise
  scsi_vhci, instance #0
  packages (driver not attached)
    SUNW,probe-error-handler (driver not attached)
    SUNW,builtin-drivers (driver not attached)
    deblocker (driver not attached)
    disk-label (driver not attached)
    terminal-emulator (driver not attached)
    obp-tftp (driver not attached)
    ufs-file-system (driver not attached)
  chosen (driver not attached)
  openprom (driver not attached)
    client-services (driver not attached)
  options, instance #0
  aliases (driver not attached)
  memory (driver not attached)
  virtual-memory (driver not attached)
  pseudo-console, instance #0
```



The prtconf output continued:

```
nvrnm (driver not attached)
pseudo-mc, instance #0
cmp (driver not attached)
  core (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
  core (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
  core (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
  core (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
pci, instance #0
  ebus, instance #0
    flashprom (driver not attached)
    serial, instance #0
    scfc, instance #0
    panel, instance #0
pci, instance #0
  pci, instance #0
    pci, instance #1
      scsi, instance #0
        tape (driver not attached)
        disk (driver not attached)
        sd, instance #1
        sd, instance #0
    pci, instance #2
      pci, instance #0
        network, instance #0
        network, instance #1 (driver not attached)
    pci, instance #3
      pci, instance #1
        network, instance #2 (driver not attached)
        network, instance #3 (driver not attached)
    pci, instance #4
pci, instance #1
  pci, instance #5
    pci, instance #6
    pci, instance #7
    pci, instance #8
os-io (driver not attached)
iscsi, instance #0
```

The `prtconf` output continued:

pseudo, instance #0
#

## 3.6.4 Using the `netstat` Command

The `netstat` command displays the network status and protocol statistics.

### 3.6.4.1 Options

[TABLE 3-9](#) lists the options of the `netstat` command and how those options can help troubleshooting.

**TABLE 3-9** Options for `netstat`

Option	Description	How it can help
-i	Displays the interface status. The information includes packets in/out, errors in/out, collisions, and queues.	Provides a quick overview of the network status.
-i <i>interval</i>	Repeats the <code>setstat</code> command in the intervals of as many seconds as specified after the -i option.	Identifies intermittent or long duration network events. By piping <code>setstat</code> output to a file, overnight activity can be viewed all at once.
-p	Displays the media table.	Provides the MAC address for hosts on the subnet.
-r	Displays the routing table.	Provides routing information.
-n	Replaces host names with IP addresses and displays them.	Used when an IP address is more useful than a host name.

The following example shows the output for the `netstat -p` command:

# netstat -p				
Net to Media Table: IPv4				
Device	IP Address	Mask	Flags	Phys Addr
-----	-----	-----	-----	-----
bge0	san-ff1-14-a	255.255.255.255	o	00:14:4f:3a:93:61
bge0	san-ff2-40-a	255.255.255.255	o	00:14:4f:3a:93:85
sppp0	224.0.0.22	255.255.255.255		
bge0	san-ff2-42-a	255.255.255.255	o	00:14:4f:3a:93:af
bge0	san09-lab-r01-66	255.255.255.255	o	00:e0:52:ec:1a:00
sppp0	192.168.1.1	255.255.255.255		
bge0	san-ff2-9-b	255.255.255.255	o	00:03:ba:dc:af:2a
bge0	bizzaro	255.255.255.255	o	00:03:ba:11:b3:c1
bge0	san-ff2-9-a	255.255.255.255	o	00:03:ba:dc:af:29
bge0	racerox-b	255.255.255.255	o	00:0b:5d:dc:08:b0
bge0	224.0.0.0	240.0.0.0	SM	01:00:5e:00:00:00
#				

## 3.6.5 Using the ping Command

The `ping` command sends an ICMP ECHO\_REQUEST packet to a network host. Depending on how the `ping` command is configured, troublesome network links or nodes can be identified from the displayed output. The destination host is specified in the variable `hostname`.

### 3.6.5.1 Options

[TABLE 3-10](#) lists the options of the `ping` command and how those options can help troubleshooting.

**TABLE 3-10** Options for `ping`

Option	Description	How it can help
<i>hostname</i>	The probe packet is sent to <i>hostname</i> and returned.	Verifies that a host is active on the network.
<i>-g hostname</i>	Forcibly routes the probe packet through a specified gateway.	By sending the probe packet through different routes to the target host, individual routes can be tested for quality.
<i>-i interface</i>	Specifies through which <i>interface</i> to send and receive the probe packet.	Enables a simple check of secondary network interfaces.

**TABLE 3-10** Options for ping (*Continued*)

Option	Description	How it can help
-n	Replaces host names with <i>IP addresses</i> and displays them.	Used when an <i>IP address</i> is more useful than a host name.
-s	Continues to repeat ping at intervals of 1 second. Pressing CTRL-C stops the execution. After it is stopped, statistics are displayed.	Helps identify intermittent or long duration network events. By piping ping output to a file, overnight activity can be viewed all at once.
-svR	Displays the route the probe packet followed in 1-second intervals.	Indicates the probe packet route and number of hops. Comparing multiple routes can identify bottlenecks.

The following example shows output for the ping -s command:

```
# ping -s san-ff2-17-a
PING san-ff2-17-a: 56 data bytes
64 bytes from san-ff2-17-a (10.1.67.31): icmp_seq=0. time=0.427 ms
64 bytes from san-ff2-17-a (10.1.67.31): icmp_seq=1. time=0.194 ms
^C
----san-ff2-17-a PING Statistics----
2 packets transmitted, 2 packets received, 0% packet loss
round-trip (ms)  min/avg/max/stddev = 0.172/0.256/0.427/0.102
#
```

## 3.6.6 Using the ps Command

The ps commands lists the status of processes. If no option is specified, the ps command outputs information about the processes that have the same execution *user ID* as the user who is executing this command and are controlled from the same control terminal as this command.

If any option is specified, the output information is controlled according to the specified option.

### 3.6.6.1 Options

TABLE 3-11 lists the options of the `ps` command and how those options can help troubleshooting.

TABLE 3-11 Options for `ps`

Option	Description	How it can help
-e	Displays information for every process.	Identifies the process ID and the executable files.
-f	Generates a full listing.	Provides the following process information: user ID, parent process ID, time when executed, and the paths to the executable files.
-o option	Enables configurable output. The <code>pid</code> , <code>pcpu</code> , <code>pmem</code> , and <code>comm</code> options display process ID, percent CPU consumption, percent memory consumption, and the relevant executable file, respectively.	Provides only most important information. Knowing the percentage of resource consumption helps identify processes that are affecting performance and might be hung.

The following example shows output for the `ps` command:

```
# ps
      PID TTY          TIME CMD
 101042 pts/3        0:00 ps
 101025 pts/3        0:00 sh
#
```

When using `sort` with the `-r` option, the column headings are output so that the value in the first column is equal to zero.

### 3.6.7 Using the `prstat` Command

The `prstat` utility repeatedly examines all the active processes in the system and reports statistics based on the selected output mode and sort order. The `prstat` command provides output similar to the `ps` command.

### 3.6.7.1 Options

TABLE 3-12 lists the options of the `prstat` command and how those options can help troubleshooting.

TABLE 3-12 Options for `prstat`

Option	Description	How it can help
No option	Displays a list of the processes sorted in descending order of consumption amount of CPU resources. The list is limited to the height of the terminal window and the total number of processes. Output is automatically updated every 5 seconds. Pressing CTRL-C stops the execution.	Output identifies the process ID, user ID, used amount of memory, state, CPU consumption, and command name.
<code>-n number</code>	Limits the number of output lines.	Limits the amount of data displayed and displays processes consuming many resources.
<code>-s key</code>	Enables the sorting of list contents by key parameter.	Useful keys are <code>cpu</code> (default), <code>time</code> , and <code>size</code> .
<code>-v</code>	Verbose mode	Displays additional parameters.

The following example shows output for the `prstat` command:

# <b>prstat -n 5 -s size</b>										
	PID	USERNAME	SIZE	RSS	STATE	PRI	NICE	TIME	CPU	PROCESS/NLWP
	100463	root	66M	61M	sleep	59	0	0:01:03	0.0%	fmd/19
	100006	root	11M	9392K	sleep	59	0	0:00:09	0.0%	svc.configd/16
	100004	root	10M	8832K	sleep	59	0	0:00:04	0.0%	svc.startd/14
	100061	root	9440K	6624K	sleep	59	0	0:00:01	0.0%	snmpd/1
	100132	root	8616K	5368K	sleep	59	0	0:00:04	0.0%	nscd/35
	Total: 52 processes, 188 lwps, load averages: 0.00, 0.00, 0.00									
	#									

# FRU Replacement Preparation

This chapter explains the method of preparing for the safe replacement of FRUs.

- [Section 4.1, “Tools Required for Maintenance” on page 4-1](#)
- [Section 4.2, “FRU Replacement and Installation Methods” on page 4-2](#)
- [Section 4.3, “Active Replacement/Active Addition” on page 4-5](#)
- [Section 4.4, “Hot Replacement/Hot Addition” on page 4-7](#)
- [Section 4.5, “Cold Replacement/Cold Addition” on page 4-11](#)

---

## 4.1 Tools Required for Maintenance

The actual maintenance work described in [Chapter 5](#) to [Chapter 15](#) requires maintenance software to confirm that the server and other components are operating correctly and to collect status information and log data on the server and components. Work for mounting, removing, or replacing a specific component requires special tools, including screwdrivers and an antistatic wrist strap. These items are generally named maintenance tools and are listed in [TABLE 4-1](#).

**TABLE 4-1** Maintenance Tools

Item	Part name	Use
1	Phillips screwdriver (No. 2)	
2	Wrist strap	For electrostatic control
3	Conductive mat	For electrostatic control
4	SunVTS	Test program

---

## 4.2 FRU Replacement and Installation Methods

This section explains how to replace and install FRUs.

### 4.2.1 FRU Replacement

There are three methods of replacing FRUs, as follows:

- Active replacement

A target FRU is operated while the Solaris OS of the domain to which the FRU belongs is operating.

The target FRU is operated by using Solaris OS commands or XSCF commands.

Because the power supply unit (PSU) and fan unit (FAN) do not belong to any domain, they are operated by using XSCF commands regardless of the operating state of the Solaris OS.

- Hot replacement

A target FRU is operated while the domain to which the FRU belongs is stopped.

Depending on the target FRU, there are two cases as follows:

- Power supply unit/Fan unit: operated with XSCF commands.
- Hard disk drive: operated directly, not by using XSCF commands.

- Cold replacement

After all the domains are stopped and then the server is powered off, a FRU is operated.

---

**Note** – Do not operate a target FRU while the OpenBoot PROM is running (the ok prompt is displayed). After stopping the relevant domain (power-off) or starting the Solaris OS, operate the target FRU.

---

### 4.2.2 FRU Installation

For empty slots without hard disk drives or PCIe cards, the number of mounted FRUs can be changed from 1 to the maximum number as required. There are some components that are tentatively mounted physically in the server. If such a



component is a hard disk drive, it is called an HDD dummy, and if such a component is a PCIe card, it is called a PCIe slot cover. These components are necessary to protect the server from noise and to properly cool the server.

The same methods as those used for replacement are used for installation.

---

**Note** – When installing a new component in an empty slot, remove the HDD dummy or PCIe slot cover and then install a new FRU.

---

[TABLE 4-2](#) lists the access locations and applicable replacement methods for each FRU.

**TABLE 4-2** FRU Access Locations and Replacement Methods

FRU	Access location	Cold replacement	Hot replacement	Active replacement	Where to find the procedure
Motherboard unit (MBU_A)	Top	Yes	No	No	<a href="#">Chapter 6</a>
Memory (DIMM)	Top	Yes	No	No	<a href="#">Chapter 7</a>
PCIe card (PCIe)	Top	Yes	No	No	<a href="#">Chapter 8</a>
Hard disk drive (HDD)	Front	Yes	Yes <sup>*</sup>	Yes <sup>d</sup>	<a href="#">Chapter 9</a>
Hard disk drive backplane (HDDBP)	Top	Yes	No	No	<a href="#">Chapter 10</a>
CD-RW/DVD-RW drive unit (DVDU)	Front/top	Yes	No	No	<a href="#">Chapter 11</a>
Power supply unit (PSU)	Rear	Yes	Yes <sup>\</sup>	Yes <sup>+</sup>	<a href="#">Chapter 12</a>
Fan unit (FAN_A)	Top	Yes	Yes <sup>+</sup>	Yes <sup>+</sup>	<a href="#">Chapter 13</a>
Fan backplane (FANBP_B)	Top	Yes	No	No	<a href="#">Chapter 14</a>
Operator panel (OPNL)	Front/top	Yes	No	No	<a href="#">Chapter 15</a>

<sup>\*</sup> The FRU is operated directly, without using XSCF commands.

<sup>\</sup> The FRU is operated with XSCF commands.

<sup>d</sup> ■ The hard disk drive has a redundant configuration only when disk mirroring software is used.

■ If a hard disk drive is an unmirrored boot device, it must be replaced by using the cold replacement procedure. However, if a boot device can be disconnected by means of a Solaris OS function or disk mirroring software function, active replacement can also be performed. The procedure for disconnecting a hard disk drive varies depending on the software being used. For details, see the manuals for the relevant software.

[TABLE 4-3](#) lists the access location and applicable installation methods for each FRU.

**TABLE 4-3** FRU Access Locations and Installation Methods

FRU	Access location	Cold addition	Hot addition	Active addition	Where to find the procedure
Motherboard unit (MBU_A)	Top	No	No	No	
Memory (DIMM)	Top	Yes	No	No	<a href="#">Chapter 7</a>
PCIe card (PCIe)	Top	Yes	No	No	<a href="#">Chapter 8</a>
Hard disk drive (HDD)	Front	Yes	Yes *	Yes	<a href="#">Chapter 9</a>
Hard disk drive backplane (HDDBP)	Top	No	No	No	
CD-RW/DVD-RW drive unit (DVDU)	Front/top	No	No	No	
Power supply unit (PSU)	Rear	No	No	No	
Fan unit (FAN_A)	Top	No	No	No	
Fan backplane (FANBP_B)	Top	No	No	No	
Operator panel (OPNL)	Front/top	No	No	No	

\* The FRU is operated directly, without using XSCF commands.

---

## 4.3 Active Replacement/Active Addition

In active replacement, the target FRU is operated while the Solaris OS of the domain to which the FRU belongs is operating.

The target FRU is operated using Solaris OS commands or XSCF commands.

Because the power supply unit (PSU) and fan unit (FAN) do not belong to any domain, they are operated by using XSCF commands regardless of the operating state of the Solaris OS.

Active replacement has the following four stages:

- “Releasing a FRU from a Domain” on page 4-5
- “FRU Removal and Replacement” on page 4-6
- “Configuring a FRU in a Domain” on page 4-6
- “Verifying the Hardware Operation” on page 4-7

For active installation, see [Section 4.3.3, “Configuring a FRU in a Domain” on page 4-6](#) and [Section 4.3.4, “Verifying the Hardware Operation” on page 4-7](#).

### 4.3.1 Releasing a FRU from a Domain

1. From the Solaris OS, type the `cfgadm` command to obtain the component status.

```
# cfgadm -a
```

2. Stop the application from using the component and disconnect the component from the Solaris OS.

The READY LED (green) of the HDD goes off.

---

**Note** – If a hard disk drive is an unmirrored boot device, it must be replaced by using the cold replacement procedure. However, if a boot device can be disconnected by means of a Solaris OS function or disk mirroring software function, active replacement can also be performed.

---

3. Type the `cfgadm -c` command to disconnect the component from the Solaris OS.

```
# cfgadm -c unconfigure Ap_Id
```

4. Type the `cfgadm -x` command to confirm that the CHECK LED blinks.

```
# cfgadm -x led=fault, mode=blink Ap_Id
```

The *Ap\_Id* is shown in the output of `cfgadm` (for example, *disk#0*).

The CHECK LED (amber) of the HDD blinks.

5. Type the `cfgadm` command to verify that the component has been disconnected.

```
# cfgadm -a
```

The disconnected component is displayed as being unconfigured.

## 4.3.2 FRU Removal and Replacement

After the disconnection of a FRU from a domain, the same procedure as that for Hot Replacement/Hot Addition applies. See [Section 4.4, “Hot Replacement/Hot Addition”](#) on page 4-7.

## 4.3.3 Configuring a FRU in a Domain

This section explains the procedure for active replacement/installation by using Solaris OS commands. For information on using the XSCF command, see [Section 4.4, “Hot Replacement/Hot Addition”](#) on page 4-7.

1. Type the `cfgadm -c` command from the Solaris OS to integrate the component into the Solaris OS.

```
# cfgadm -c configure Ap_Id
```

2. Type the `cfgadm -x` command to confirm that the CHECK LED is off.

```
# cfgadm -x led=fault, mode=off Ap_Id
```

The *Ap\_Id* is shown in the output of `cfgadm` (for example, *disk#0*).

The CHECK LED (amber) of the HDD is turned off.

3. Type the `cfgadm` command to verify that the component has been configured.

```
# cfgadm -a
```

The configured component is displayed as being configured.

The READY LED (green) of the HDD goes on.

## 4.3.4 Verifying the Hardware Operation

- Confirm the status of the LED indicators.

For information on the LED status, see [TABLE 2-3](#) and [TABLE 2-5](#).

---

## 4.4 Hot Replacement/Hot Addition

In hot replacement, the target FRU is operated while the domain to which the FRU belongs is stopped.

Depending on the target FRU, there are two cases as follows:

- Power supply unit/Fan unit: operated with XSCF commands.
- Hard disk drive: operated directly, not by using XSCF commands.

For hot addition, do the same operation as that for hot replacement.

## 4.4.1 FRU Removal and Replacement

- Type the `replacefru` command from the XSCF shell prompt.

```
XSCF> replacefru
```

```
-----  
Maintenance/Replacement Menu  
Please select a type of FRU to be replaced.
```

- ```
1. FAN          (Fan Unit)  
2. PSU          (Power Supply Unit)  
-----
```

```
Select [1,2|c:cancel] :1
```

```
-----  
Maintenance/Replacement Menu  
Please select a FAN to be replaced.
```

```
No. FRU          Status  
-----
```

- ```
1. FAN_A#0       Normal  
2. FAN_A#1       Normal  
-----
```

```
Select [1,2|b:back] :1
```

```
You are about to replace FAN_A#0.  
Do you want to continue?[r:replace|c:cancel] :r
```

```
Please confirm the Check LED is blinking.  
If this is the case, please replace FAN_A#0.  
After replacement has been completed, please select[f:finish] :f
```

The `replacefru` command automatically tests the status of the component after the completion of removal and replacement.

```
Diagnostic tests for FAN_A#0 have started.
[This operation may take up to 3 minute(s)]
(progress scale reported in seconds)
  0..... 30..done
-----
Maintenance/Replacement Menu
Status of the replaced FRU.

FRU              Status
-----
FAN_A#0          Normal
-----
The replacement of FAN_A#0 has completed normally.[f:finish] :f
-----
Maintenance/Replacement Menu
Please select a type of FRU to be replaced.

1. FAN           (Fan Unit)
2. PSU           (Power Supply Unit)
-----
Select [1,2|c:cancel] :c
```

The display may vary depending on the XCP version

When the tests are complete, the program displays the original menu again. To return to the XSCF shell prompt, select cancel.

For details, see the manual pages of `replacefru`.

## 4.4.2 Verifying the Hardware Operation

1. Type the `showhardconf` command to confirm that the new component has been installed.

```
XSCF> showhardconf
SPARC Enterprise M3000;
+ Serial:IKK0813023; Operator_Panel_Switch:Locked;
+ Power_Supply_System:Single; SCF-ID:XSCF#0;
+ System_Power:On; System_Phase:Cabinet Power On;
Domain#0 Domain_Status:OpenBoot Execution Completed;

MBU_A Status:Normal; Ver:0101h; Serial:PP082202QX ;
+ FRU-Part-Number:CA07082-D901 A1 /541-3302-01 ;
+ CPU Status:Normal;
+ Freq:2.520 GHz; Type:32;
+ Core:4; Strand:2;
+ Memory_Size:8 GB;
MEM#0A Status:Normal;
+ Code:ce00000000000001M3 93T2950EZA-CE6 4145-473b3c23;
+ Type:1A; Size:1 GB;
MEM#0B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2918;
+ Type:1A; Size:1 GB;
MEM#1A Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b28af;
+ Type:1A; Size:1 GB;
MEM#1B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b28ab;
+ Type:1A; Size:1 GB;
MEM#2A Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b283e;
+ Type:1A; Size:1 GB;
MEM#2B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2829;
+ Type:1A; Size:1 GB;
MEM#3A Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2840;
+ Type:1A; Size:1 GB;
MEM#3B Status:Normal;
+ Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2830;
+ Type:1A; Size:1 GB;
PCI#0 Name_Property:fibre-channel; Card_Type:Other;
PCI#1 Name_Property:fibre-channel; Card_Type:Other;
PCI#2 Name_Property:pci; Card_Type:Other;
PCI#3 Name_Property:pci; Card_Type:Other;
```



The showhardconf output continued:

```
OPNL Status:Normal; Ver:0101h; Serial:PP082202R8 ;
+ FRU-Part-Number:CA07082-D911 A1 /541-3306-01 ;
PSU#0 Status:Normal; Serial:EA08210127;
+ FRU-Part-Number:CA01022-0720 02B /300-2193-02 ;
+ Power_Status:On;
PSU#1 Status:Normal; Serial:EA08210131;
+ FRU-Part-Number:CA01022-0720 02B /300-2193-02 ;
+ Power_Status:On;
FANBP_B Status:Normal; Ver:0101h; Serial:PP0821031E ;
+ FRU-Part-Number:CA20399-B12X 004AA/541-3304-01 ;
FAN_A#0 Status:Normal;
FAN_A#1 Status:Normal;
XSCF>
```

For details, see the manual pages of showhardconf.

## 2. Confirm the state of the status LEDs of the FRU.

For information on the LED status, see [TABLE 2-3](#) and [TABLE 2-5](#).

---

## 4.5 Cold Replacement/Cold Addition

In cold replacement, all business operations must be stopped. When accessing the server, power off the server and disconnect the power cord to ensure safety.

For cold addition, do the same operation as that for cold replacement.

### 4.5.1 Powering off the Server

This section explains how to power off the server.

#### 4.5.1.1 Power-off by Using the XSCF Command

1. Notify users that the server is being powered off.
2. Back up the system files and data to tape, if necessary.
3. Turn the mode switch on the operator panel to the Service position.

4. A user with `platadm` or `fieldeng` authority must log in to the XSCF shell and enter the `poweroff` command.

```
XSCF> poweroff -a
```

The following activity is executed when the `poweroff` command is used:

- The Solaris OS shuts down completely.
- The server is powered off and the server enters standby mode. (The power to the XSCF unit remains on.)

For details, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

5. Verify that the **POWER LED** on the operator panel is off.
6. Disconnect all the power cords from the AC power outlets.



---

**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.

---

#### 4.5.1.2 Power off by Using the Operator Panel

1. Notify users that the server is being powered off.
2. Back up the system files and data to tape, if necessary.
3. Turn the mode switch on the operator panel to the **Service** position.
4. Press the power switch on the operator panel for 4 seconds or more.
5. Verify that the **POWER LED** on the operator panel is off.
6. Disconnect all the power cords from the AC power outlets.



---

**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.

---

### 4.5.2 FRU Removal and Replacement

In cold replacement, a FRU is removed and replaced while the power is turned off. After the FRU replacement, power on the server.

## 4.5.3 Powering on the Server

This section explains how to power on the server.

### 4.5.3.1 Power-on by Using the XSCF Command

1. Verify that the server has enough power supply units to operate in the desired configuration.
2. Connect all the power cords to AC power outlets.
3. Verify that the XSCF STANDBY LED on the operator panel is on.
4. Turn the mode switch on the operator panel to the desired mode position (Locked or Service).
5. A user with `platadm` or `fieldeng` authority must log in to the XSCF shell and type the `poweron` command.

```
XSCF> poweron -a
```

Soon, the following activity is executed:

- The POWER LED on the operator panel is turned on.
- The power-on self-test (POST) is executed.

Then, the server is completely powered on.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the `ok` prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

For details, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

### 4.5.3.2 Power-on by Using the Operator Panel

1. Verify that the server has enough power supply units to operate in the desired configuration.
2. Connect all the power cords to AC power outlets.
3. Verify that the XSCF STANDBY LED on the operator panel is on.
4. Turn the mode switch on the operator panel to the desired mode position (Locked or Service).

**5. Press the power button on the operator panel.**

Soon, the following activity is executed:

- The POWER LED on the operator panel is turned on.
- The power-on self-test (POST) is executed.

Then, the server is completely powered on.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the ok prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

## 4.5.4 Verifying the Hardware Operation

1. In response to the `ok` prompt, press the `ENTER` key and enter `"#"` (default value) and then press the `"."` (period) key.

The domain console is switched to the XSCF console.

2. Use the `showhardconf` command to confirm that the new component has been installed.

```
XSCF> showhardconf
SPARC Enterprise M3000;
+ Serial:IKK0813023; Operator_Panel_Switch:Locked;
+ Power_Supply_System:Single; SCF-ID:XSCF#0;
+ System_Power:On; System_Phase:Cabinet Power On;
Domain#0 Domain_Status:OpenBoot Execution Completed;

MBU_A Status:Normal; Ver:0101h; Serial:PP082202QX ;
+ FRU-Part-Number:CA07082-D901 A1 /541-3302-01 ;
+ CPU Status:Normal;
+ Freq:2.520 GHz; Type:32;
+ Core:4; Strand:2;
+ Memory_Size:8 GB;
MEM#0A Status:Normal;
+ Code:ce000000000000001M3 93T2950EZA-CE6 4145-473b3c23;
+ Type:1A; Size:1 GB;
MEM#0B Status:Normal;
+ Code:7f7ffe000000000004aEBE10RD4AJFA-5C-E 3020-223b2918;
+ Type:1A; Size:1 GB;
MEM#1A Status:Normal;
+ Code:7f7ffe000000000004aEBE10RD4AJFA-5C-E 3020-223b28af;
+ Type:1A; Size:1 GB;
MEM#1B Status:Normal;
+ Code:7f7ffe000000000004aEBE10RD4AJFA-5C-E 3020-223b28ab;
+ Type:1A; Size:1 GB;
MEM#2A Status:Normal;
+ Code:7f7ffe000000000004aEBE10RD4AJFA-5C-E 3020-223b283e;
+ Type:1A; Size:1 GB;
MEM#2B Status:Normal;
+ Code:7f7ffe000000000004aEBE10RD4AJFA-5C-E 3020-223b2829;
+ Type:1A; Size:1 GB;
MEM#3A Status:Normal;
+ Code:7f7ffe000000000004aEBE10RD4AJFA-5C-E 3020-223b2840;
+ Type:1A; Size:1 GB;
MEM#3B Status:Normal;
+ Code:7f7ffe000000000004aEBE10RD4AJFA-5C-E 3020-223b2830;
+ Type:1A; Size:1 GB;
PCI#0 Name_Property:fibre-channel; Card_Type:Other;
PCI#1 Name_Property:fibre-channel; Card_Type:Other;
```

The showhardconf output continued:

```
PCI#2 Name_Property:pci; Card_Type:Other;
PCI#3 Name_Property:pci; Card_Type:Other;
OPNL Status:Normal; Ver:0101h; Serial:PP082202R8 ;
+ FRU-Part-Number:CA07082-D911 A1 /541-3306-01 ;
PSU#0 Status:Normal; Serial:EA08210127;
+ FRU-Part-Number:CA01022-0720 02B /300-2193-02 ;
+ Power_Status:On;
PSU#1 Status:Normal; Serial:EA08210131;
+ FRU-Part-Number:CA01022-0720 02B /300-2193-02 ;
+ Power_Status:On;
FANBP_B Status:Normal; Ver:0101h; Serial:PP0821031E ;
+ FRU-Part-Number:CA20399-B12X 004AA/541-3304-01 ;
FAN_A#0 Status:Normal;
FAN_A#1 Status:Normal;
```

XSCF>

For details, see the manual pages of showhardconf.

3. Type the `console` command to switch from the XSCF console to the `ok` prompt (domain console) again:

```
XSCF> console -d 0
```

4. From the `ok` prompt, type the `show-devs` command to confirm that all the PCIe cards are mounted.

```
{0} ok show-devs
/pci@1,700000
/pci@0,600000
/pci@8,4000
/cmp@400,0
/pseudo-mc@200,200
/nvram
/pseudo-console
/virtual-memory
/memory@m0
/aliases
/options
/openprom
/chosen
/packages
```

The show-devs output continued:

```
/pci@1,700000/pci@0
/pci@1,700000/pci@0/pci@9
/pci@1,700000/pci@0/pci@8
/pci@1,700000/pci@0/pci@0
/pci@1,700000/pci@0/pci@9/pci@0
/pci@1,700000/pci@0/pci@9/pci@0/FJSV,e2ta@4,1
/pci@1,700000/pci@0/pci@9/pci@0/FJSV,e2ta@4
/pci@1,700000/pci@0/pci@8/pci@0
/pci@1,700000/pci@0/pci@8/pci@0/FJSV,e2ta@4,1
/pci@1,700000/pci@0/pci@8/pci@0/FJSV,e2ta@4
/pci@1,700000/pci@0/pci@0/pci@0
/pci@1,700000/pci@0/pci@0/pci@0/FJSV,e2ta@4,1
/pci@1,700000/pci@0/pci@0/pci@0/FJSV,e2ta@4
/pci@0,600000/pci@0
/pci@0,600000/pci@0/pci@8
/pci@0,600000/pci@0/pci@2
/pci@0,600000/pci@0/pci@1
/pci@0,600000/pci@0/pci@0
/pci@0,600000/pci@0/pci@8/pci@0
/pci@0,600000/pci@0/pci@8/pci@0/FJSV,e2ta@4,1
/pci@0,600000/pci@0/pci@8/pci@0/FJSV,e2ta@4
/pci@0,600000/pci@0/pci@2/pci@0
/pci@0,600000/pci@0/pci@2/pci@0/network@4,1
/pci@0,600000/pci@0/pci@2/pci@0/network@4
/pci@0,600000/pci@0/pci@1/pci@0
/pci@0,600000/pci@0/pci@1/pci@0/network@4,1
/pci@0,600000/pci@0/pci@1/pci@0/network@4
/pci@0,600000/pci@0/pci@0/scsi@0
/pci@0,600000/pci@0/pci@0/scsi@0/disk
/pci@0,600000/pci@0/pci@0/scsi@0/tape
/pci@8,4000/ebus@1
/pci@8,4000/ebus@1/panel@14,280030
/pci@8,4000/ebus@1/scfc@14,200000
/pci@8,4000/ebus@1/serial@14,400000
/pci@8,4000/ebus@1/flashprom@10,0
/cmp@400,0/core@3
/cmp@400,0/core@2
/cmp@400,0/core@1
/cmp@400,0/core@0
/cmp@400,0/core@3/cpu@1
/cmp@400,0/core@3/cpu@0
/cmp@400,0/core@2/cpu@1
/cmp@400,0/core@2/cpu@0
/cmp@400,0/core@1/cpu@1
/cmp@400,0/core@1/cpu@0
```

The show-devs output continued:

```
/cmp@400,0/core@0/cpu@1
/cmp@400,0/core@0/cpu@0
/openprom/client-services
/packages/obp-tftp
/packages/terminal-emulator
/packages/disk-label
/packages/deblocker
/packages/SUNW,builtin-drivers
/packages/SUNW,probe-error-handler
{0} ok
```

**5. Type the probe-scsi-all command to confirm that the storage devices are mounted.**

```
{0} ok probe-scsi-all
/pci@0,600000/pci@0/pci@0/scsi@0

MPT Version 1.05, Firmware Version 1.24.00.00

Target 0
Unit 0   Disk      FUJITSU MAY2073RC      3701      143374738 Blocks, 73 GB
      SASAddress 500000e0197292c2   PhyNum 0
Target 1
Unit 0   Disk      FUJITSU MAY2073RC      3701      143374738 Blocks, 73 GB
      SASAddress 500000e019728f22   PhyNum 1
Target 2
Unit 0   Disk      FUJITSU MAY2073RC      3701      143374738 Blocks, 73 GB
      SASAddress 500000e019729002   PhyNum 2
Target 3
Unit 0   Disk      FUJITSU MAY2073RC      3701      143374738 Blocks, 73 GB
      SASAddress 500000e019729302   PhyNum 3
Target 4
Unit 0   Removable Read Only device      MATSHITADVD-RAM UJ875AS 1000
      SATA device  PhyNum 4

{0} ok
```

**6. Type the boot command to start the Solaris OS.**

```
ok boot
```



## Internal Components Access

---

This chapter explains how to access internal components.

- [Section 5.1, “Sliding the Server Into and Out of the Equipment Rack” on page 5-1](#)
- [Section 5.2, “Removing and Attaching the Top Cover” on page 5-3](#)
- [Section 5.3, “Removing and Attaching the Air Duct” on page 5-4](#)
- [Section 5.4, “Removing and Attaching the Fan Cover” on page 5-7](#)

---

### 5.1 Sliding the Server Into and Out of the Equipment Rack

This section explains how to slide the server out from the equipment rack and how to push it into the equipment rack.

For details of equipment racks, see the *SPARC Enterprise Equipment Rack Mounting Guide*.

#### 5.1.1 Sliding the Server Out from the Equipment Rack



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – If cable management arms are not attached, remove the cable ties securing the PCI cables to the rear of the server and slide the server out.

---



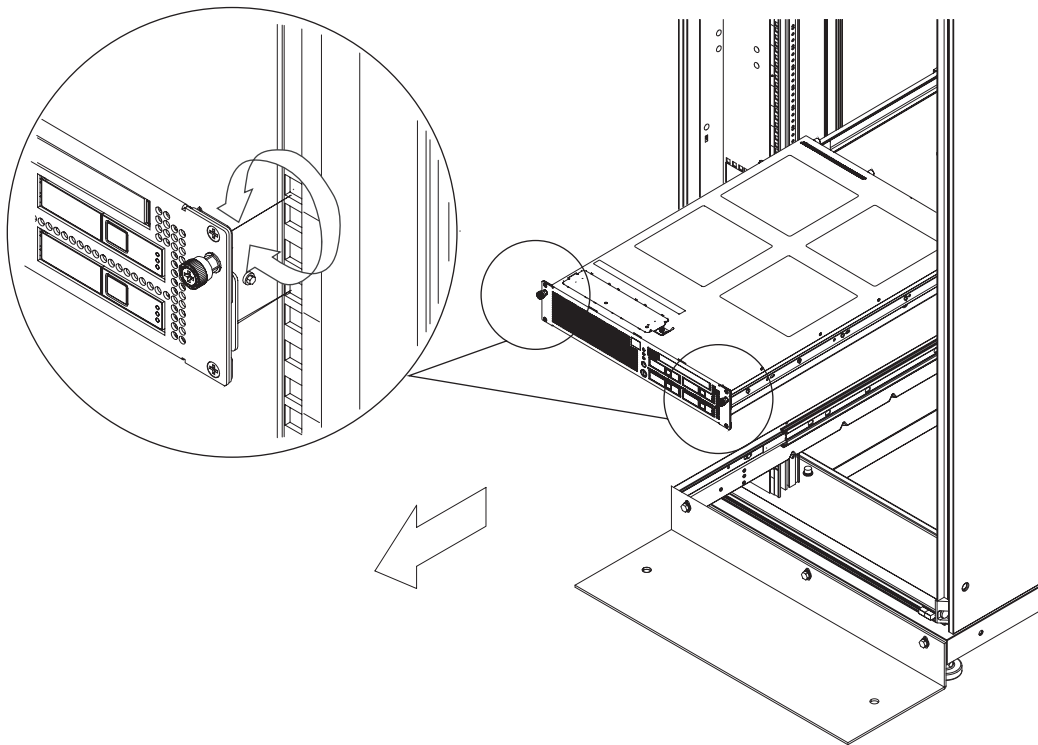
---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions”](#) on page 1-1.

---

1. If the equipment rack is supplied with a stabilizer, be sure to install it.
2. Slide the server out as far as possible.  
When the server is drawn out completely, the server is automatically locked in the predetermined position.
3. Loosen the two screws at the front of the server ([FIGURE 5-1](#)).

**FIGURE 5-1** Pulling the Server Out from an Equipment Rack



4. Slide the server out.

## 5.1.2 Sliding the Server into the Equipment Rack

1. Push the server back into the equipment rack.
2. Tighten the two screws at the front of the server to secure it in the equipment rack (FIGURE 5-1).
3. Return the stabilizer of the equipment rack to its original position.

---

## 5.2 Removing and Attaching the Top Cover



---

**Caution** – All internal components can be replaced in cold replacement mode. The server must be powered off and the power cord must be disconnected from the AC power supply. Before the top cover is removed, the server must be pulled out from the equipment rack. For the procedure for pulling the server out from the equipment rack, see [Section 5.1, “Sliding the Server Into and Out of the Equipment Rack”](#) on page 5-1.

---

### 5.2.1 Removing the Top Cover



---

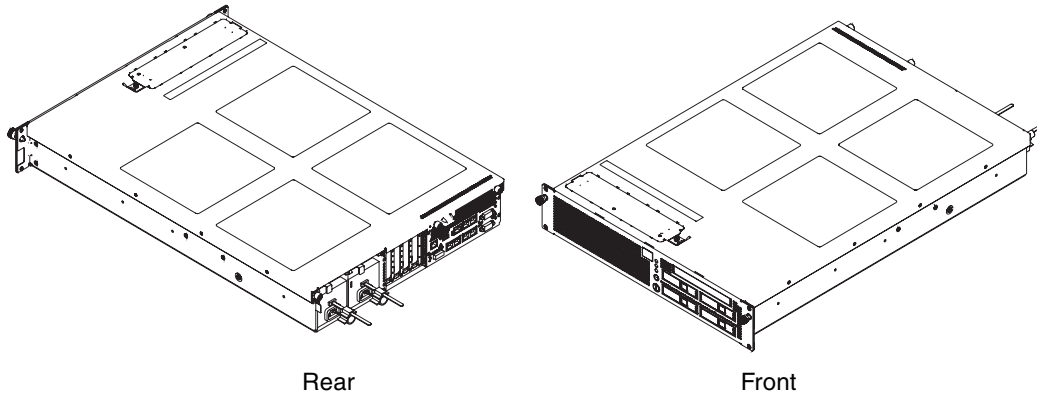
**Caution** – All internal components can be replaced in cold replacement mode. The server must be powered off and the power cord must be disconnected from the AC power supply.

---

1. Loosen the three screws at the top rear of the server.

2. To remove the top cover, slide it toward the rear side and raise it ([FIGURE 5-2](#)).

**FIGURE 5-2** Removing the Top Cover



## 5.2.2 Attaching the Top Cover

1. Align the top cover.
2. Tighten the three screws at the top rear of the server to secure the top cover in the predetermined position.
3. Push the server back into the equipment rack.

For details, see "[Section 5.1.2, "Sliding the Server into the Equipment Rack"](#)" on [page 5-3](#).

---

## 5.3 Removing and Attaching the Air Duct



---

**Caution** – All internal components can be replaced in cold replacement mode. The server must be powered off and the power cord must be disconnected from the AC power supply. Before the top cover is removed, the server must be pulled out from the equipment rack.

---

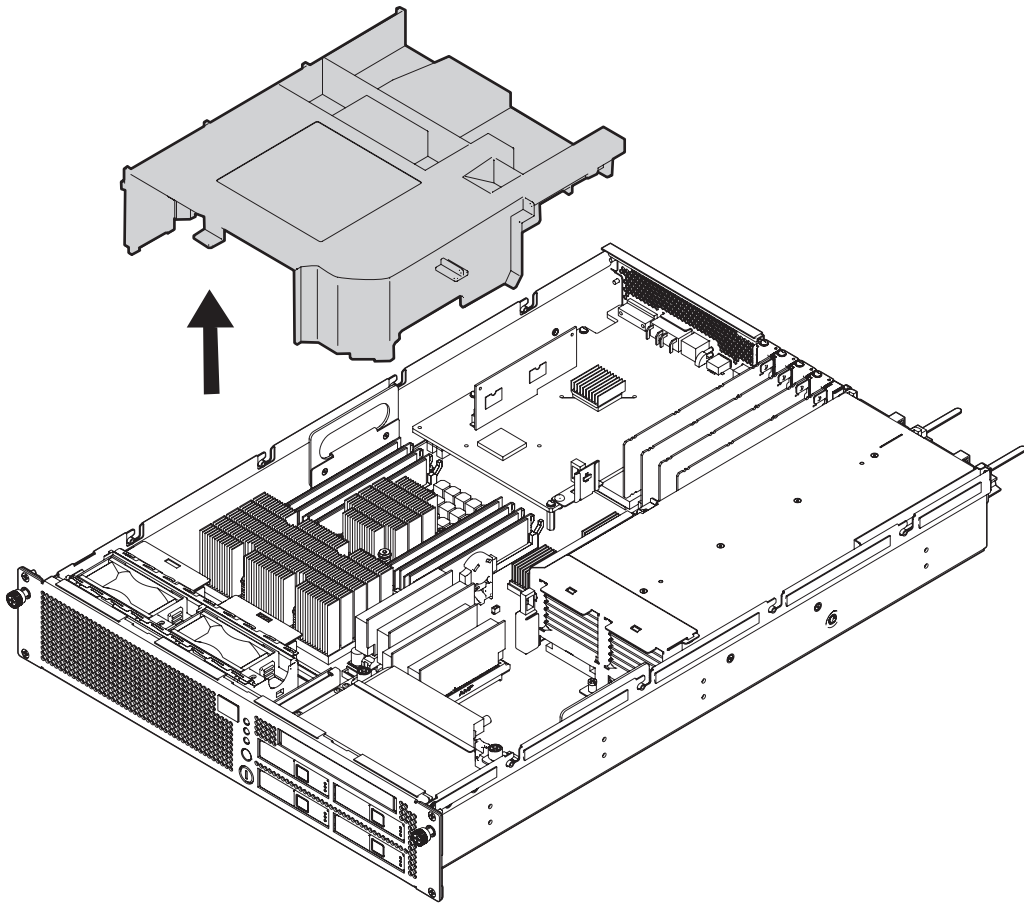
## 5.3.1 Accessing the Air Duct

Before the air duct is removed, the top cover must be removed. For details, see [Section 5.2, “Removing and Attaching the Top Cover”](#) on page 5-3

## 5.3.2 Removing the Air Duct

- Hold the air duct and lift it upwards.

**FIGURE 5-3** Removing the Air Duct

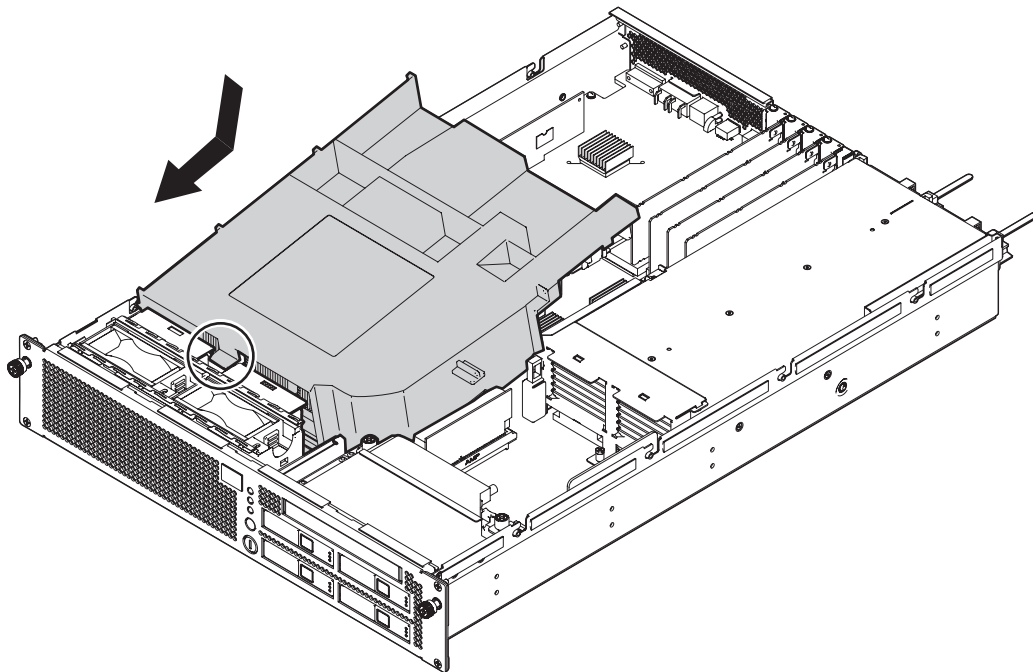


### 5.3.3 Attaching the Air Duct

- Set the tab at the front of the air duct in place and then lower the air duct (FIGURE 5-4).

Prevent cables from interfering each other.

**FIGURE 5-4** Attaching the Air Duct



## 5.4 Removing and Attaching the Fan Cover

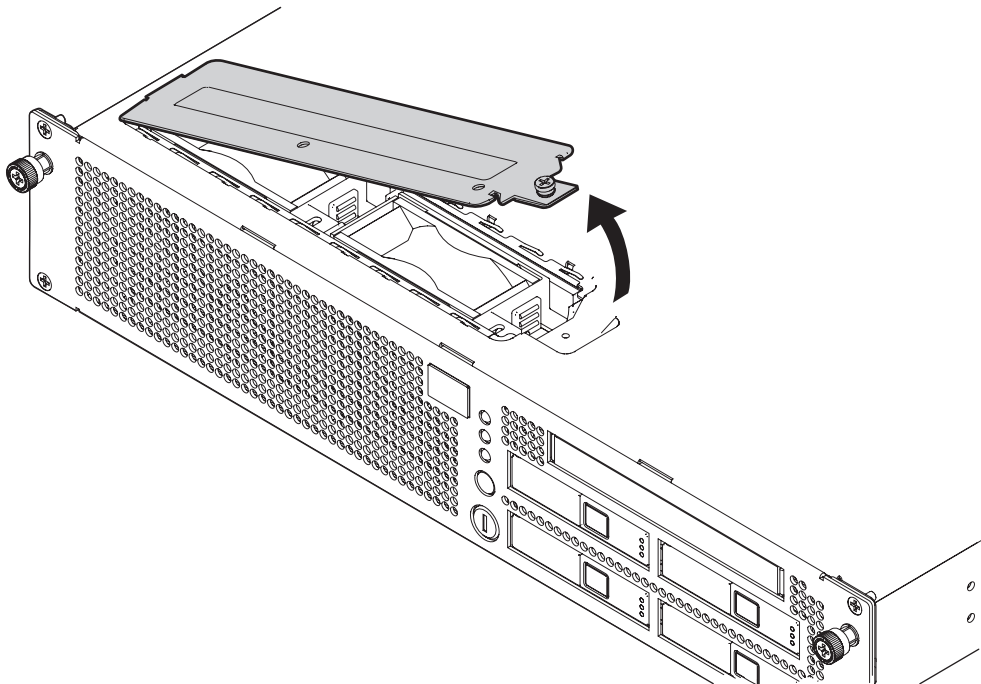
### 5.4.1 Removing the Fan Cover



**Caution** – Before the fan cover is removed, the server must be pulled out from the equipment rack. For the procedure for pulling the server out from the equipment rack, see "[Section 5.1, “Sliding the Server Into and Out of the Equipment Rack”](#)" on [page 5-1](#).

1. Loosen one screw at the right of the fan cover.
2. Raise the right end of the fan cover and remove it ([FIGURE 5-5](#)).

**FIGURE 5-5** Removing the Fan Cover



## 5.4.2 Attaching the Fan Cover

1. **Align the tab on the left end of the fan cover in the predetermined position and then secure the fan cover in position.**
2. **Tighten the one screw on the right side of the fan cover.**
3. **Push the server back into the equipment rack.**

For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack” on page 5-3](#).



## Motherboard Unit Replacement

---

This chapter explains how to replace the motherboard unit.

- [Section 6.1, “Accessing the Motherboard Unit” on page 6-4](#)
- [Section 6.2, “Removing the Motherboard Unit” on page 6-7](#)
- [Section 6.3, “Mounting the Motherboard Unit” on page 6-8](#)
- [Section 6.4, “Reassembling the Server” on page 6-9](#)

The motherboard unit is a cold replacement component. The server must be completely powered off, the power cords must be disconnected, and all DIMMs and PCIe cards must be removed, before the motherboard unit is replaced. See [Chapter 7, Replacement and Installation of Memory](#) and [Chapter 8, Replacement and Installation of PCIe Cards](#).

---

**Note** – Do not replace the motherboard unit and the operator panel at the same time. Otherwise, the system may not operate correctly. Use the `showhardconf` command or `showstatus` command to verify that the replacement unit of the first replaced FRU is fully operational, before replacing the other FRU.

---

---

**Note** – When replacing the motherboard unit, attach connection destination labels to each of the LAN cable and UPS cable connected to the XSCF unit before removing these cables.

---

---

**Note** – When mounting the motherboard unit, connect the LAN cable and UPS cable to the XSCF unit.

---

---

**Note** – After the replacement of the motherboard unit is completed, the system clock must be reset. For details of the setting method, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

---

---

**Note** – After the replacement of the motherboard unit is completed, the versions of the XCP and Solaris OS must be checked. For details of version number checking and other such tasks, see the *SPARC Enterprise M3000/M4000/M5000/M8000/M9000 Servers XSCF User's Guide*.

---

Because the XSCF unit is mounted on the motherboard unit, it cannot be replaced singly. For details of the XSCF unit, see the [Appendix C.2.4](#).

FIGURE 6-1 indicates the location of the motherboard unit.

**FIGURE 6-1** Motherboard Unit Location

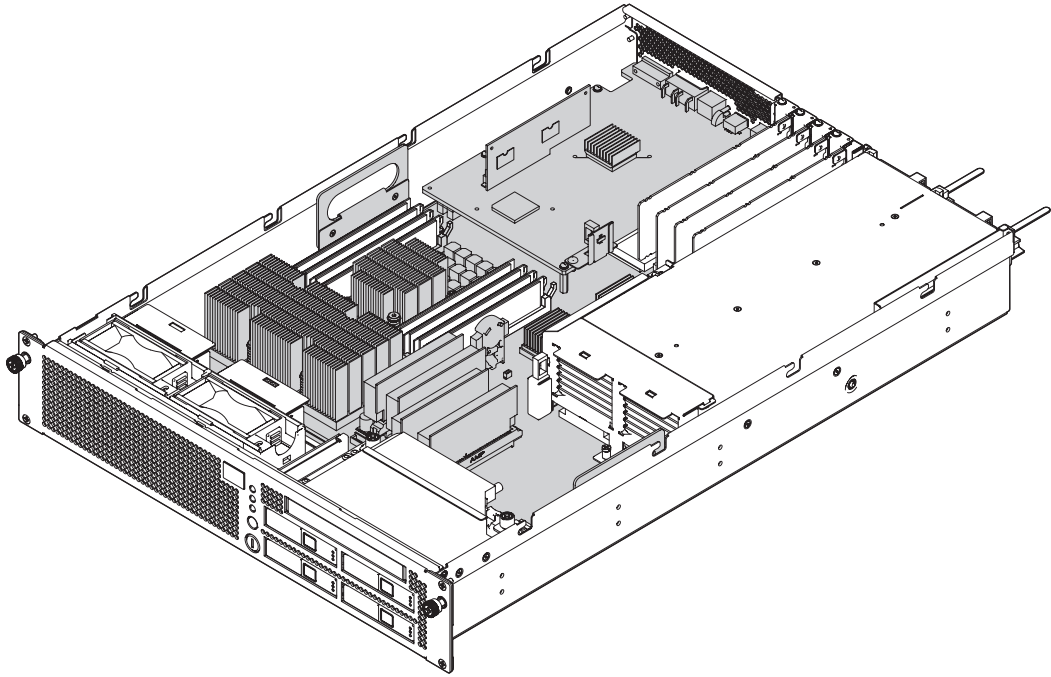
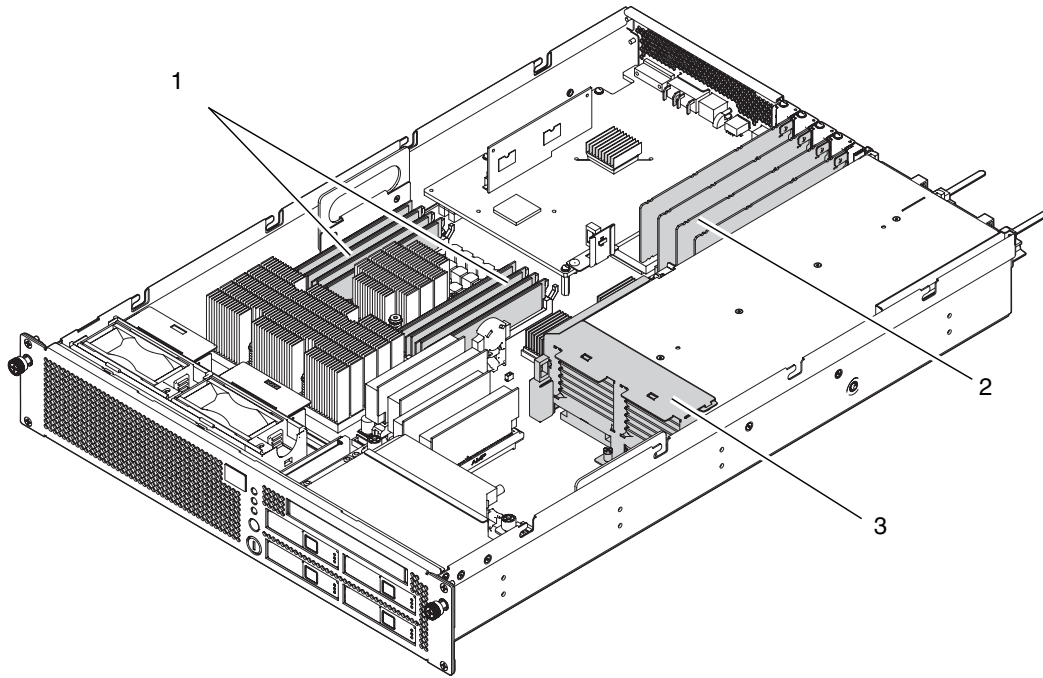


FIGURE 6-2 indicates the locations of DIMMs, PCIe cards, and shutter unit.

FIGURE 6-2 Locations of DIMMs, PCIe Cards, and Shutter Unit



Location number	Component
1	Memory (DIMM)
2	PCIe card
3	Shutter unit

## 6.1 Accessing the Motherboard Unit



**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.

---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions” on page 1-1](#).

---

**1. Power off the server.**

This procedure includes the steps of turning the mode switch on the operator panel to the Service position, verifying that the POWER LED is off, and disconnecting the power cord. For details, see [Section 4.5.1, “Powering off the Server” on page 4-11](#).

**2. Remove all the cables from the external interface block on the rear panel.**



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

**3. Pull the power supply unit out several centimeters to the rear side.**

**4. Slide the server out from the equipment rack.**

For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack” on page 5-1](#).

**5. Loosen the screws securing the cable management arm to the left rear of the server.**

**6. Pull the cable management arm out from the equipment rack.**

**7. Remove the top cover.**

For details, see [Section 5.2.1, “Removing the Top Cover” on page 5-3](#).

**8. Remove the PCIe cards.**

For details, see [Section 8.2, “Removing a PCIe Card” on page 8-4](#).

**9. Remove the air duct.**

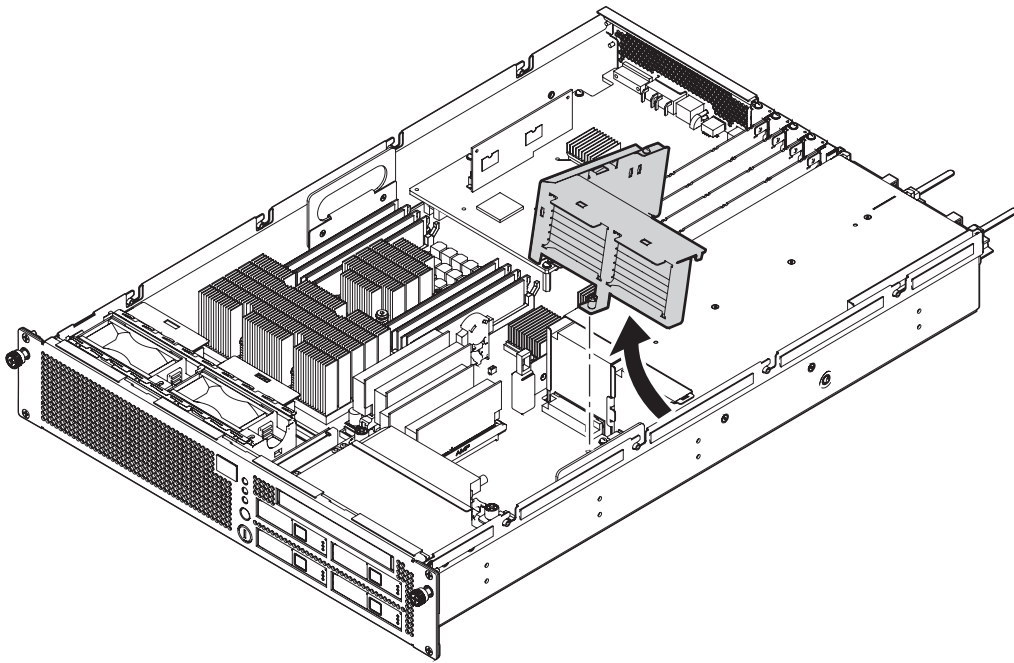
For details, see [Section 5.3.2, “Removing the Air Duct” on page 5-5](#).

**10. Disconnect all the cables from the motherboard unit.**

**11. Loosen the two screws securing the shutter unit, and slide the securing bracket on the power supply unit.**

## 12. Remove the shutter unit.

**FIGURE 6-3** Removing the Shutter Unit

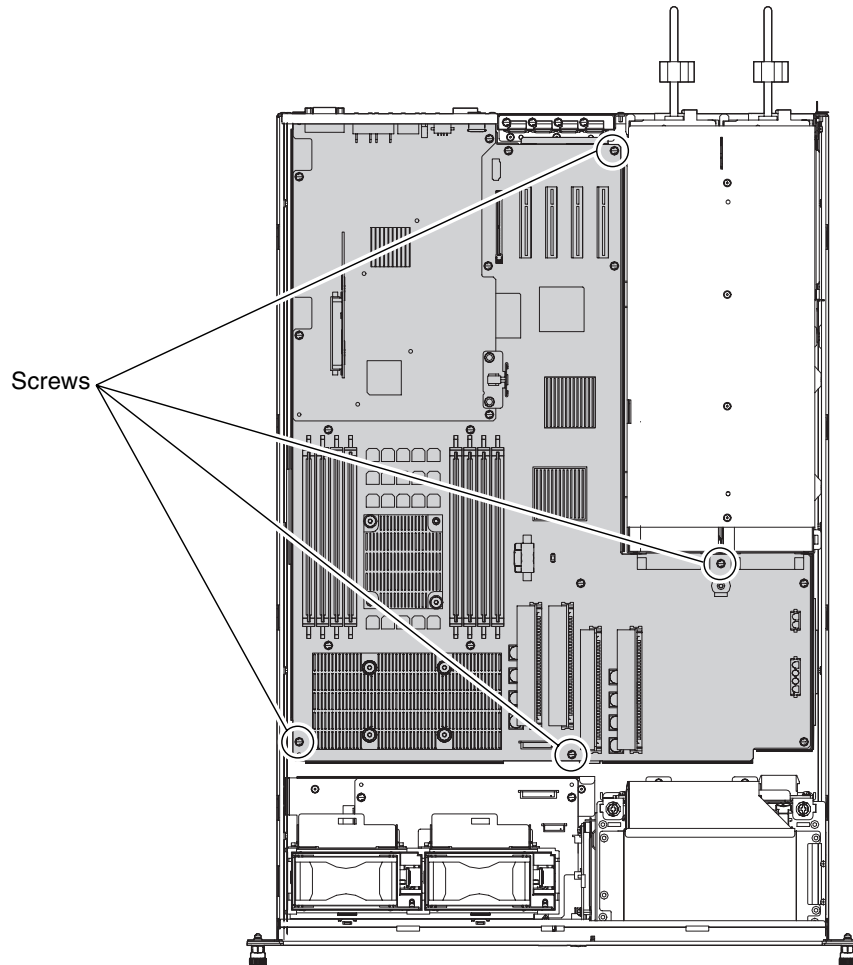


---

## 6.2 Removing the Motherboard Unit

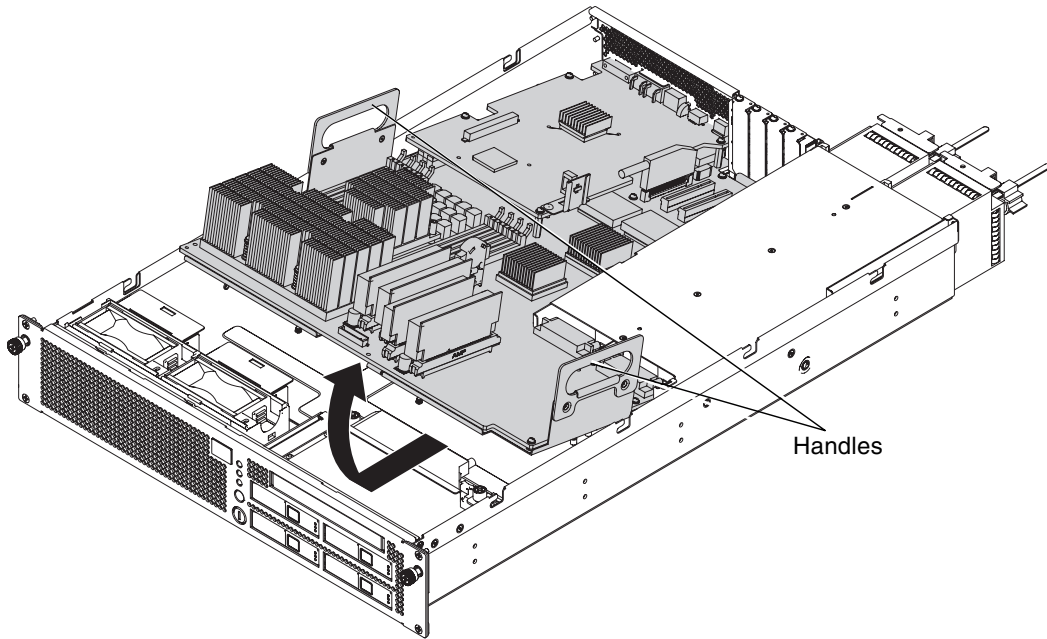
1. Remove the four screws securing the motherboard unit.

**FIGURE 6-4** Securing Screw Locations on Motherboard Unit



2. Hold the two opaque handles on both sides of the motherboard unit and lift the motherboard unit while sliding it out.

**FIGURE 6-5** Removing the Motherboard Unit



3. Remove the motherboard unit from the server, and place it on a conductive mat.

When removing the motherboard unit from the server, take care not to damage the connector.

4. Remove the DIMMs.

For details, see [Section 7.2, “Removing the DIMMs”](#) on page 7-4.

---

## 6.3 Mounting the Motherboard Unit

1. Hold the two opaque handles on both sides of the motherboard unit and slide the unit in while lowering it to align with the predetermined position from the front of the server.

When mounting the motherboard unit in the server, take care not to damage the connector.



2. Install and tighten the four screws to secure the motherboard unit in position.

---

## 6.4 Reassembling the Server

1. Align the shutter unit with the securing bracket on the power supply unit, and secure it with the two screws.
2. Mount the DIMMs.  
For details, see [Section 7.3, “Installing the DIMMs”](#) on page 7-5.
3. Reconnect all the cables to their original connection destinations on the motherboard unit.
4. Attach the air duct.  
For details, see [Section 5.3.3, “Attaching the Air Duct”](#) on page 5-6.
5. Mount the PCIe cards  
For details, see [Section 8.3, “Mounting a PCIe Card”](#) on page 8-4.
6. Attach the top cover.  
For details, see [Section 5.2.2, “Attaching the Top Cover”](#) on page 5-4.
7. Slide the server into the equipment rack and secure the stabilizer bar.  
For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.
8. Mount the power supply unit correctly.
9. Power on the server.  
This procedure includes the steps of reconnecting the power cord, checking the LED status, and turning the mode switch on the operator panel to the Locked position. For details, see [Section 4.5.3.1, “Power-on by Using the XSCF Command”](#) on page 4-13.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the ok prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

10. Check the hardware.

This procedure includes the steps of running a program to verify that all the components have been remounted and starting the Solaris OS.

For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on page 4-15.



# Replacement and Installation of Memory

---

This chapter explains how to replace and install memory (DIMMs).

- [Section 7.1, “Accessing the DIMMs” on page 7-3](#)
- [Section 7.2, “Removing the DIMMs” on page 7-4](#)
- [Section 7.3, “Installing the DIMMs” on page 7-5](#)
- [Section 7.4, “Reassembling the Server” on page 7-5](#)

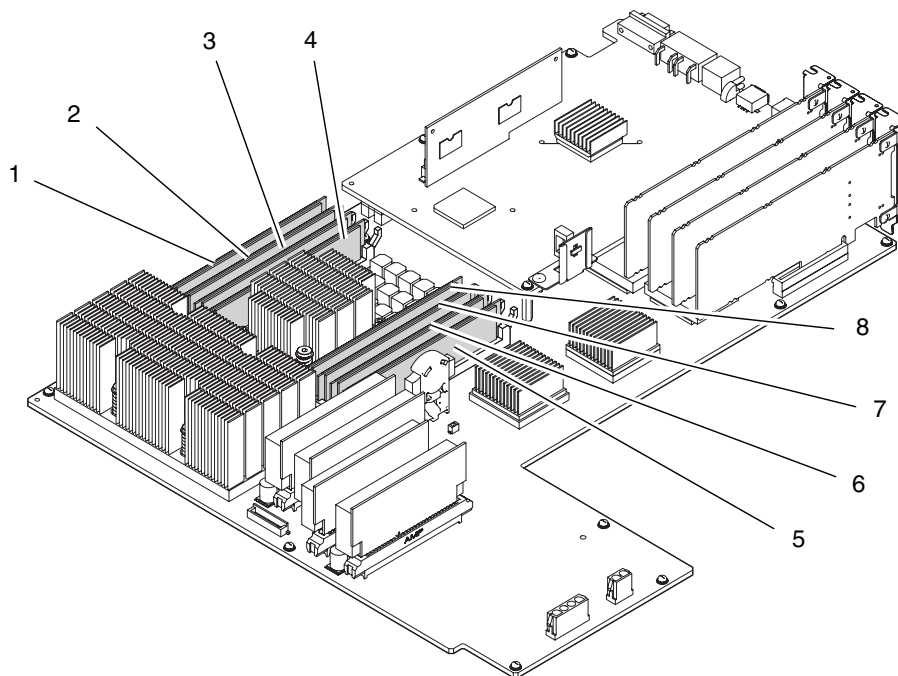
DIMMs are cold replacement components. This means that the entire server must be powered off and the power cords must be disconnected to replace the DIMMs.

For information on the mounting conditions of DIMMs, see [Appendix B](#).

The same methods as those for replacement are used for installation of DIMMs.

FIGURE 7-1 shows the locations of DIMMs and memory slots.

**FIGURE 7-1** Locations of DIMMs and Memory Slots



Location number	Component
1	MEM#00A, memory slot (group A)
2	MEM#00B, memory slot (group B)
3	MEM#01A, memory slot (group A)
4	MEM#01B, memory slot (group B)
5	MEM#02A, memory slot (group A)
6	MEM#02B, memory slot (group B)
7	MEM#03A, memory slot (group A)
8	MEM#03B, memory slot (group B)

---

## 7.1 Accessing the DIMMs



---

**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.

---



---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions” on page 1-1](#).

---

### 1. Power off the server.

This procedure includes the steps of turning the mode switch on the operator panel to the Service position, verifying that the POWER LED is off, and disconnecting the power cord. For details, see [Section 4.5.1, “Powering off the Server” on page 4-11](#).

### 2. Slide the server out from the equipment rack.

For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack” on page 5-1](#).



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

### 3. Remove the top cover.

For details, see [Section 5.2.1, “Removing the Top Cover” on page 5-3](#).

### 4. Remove the air duct from the server.

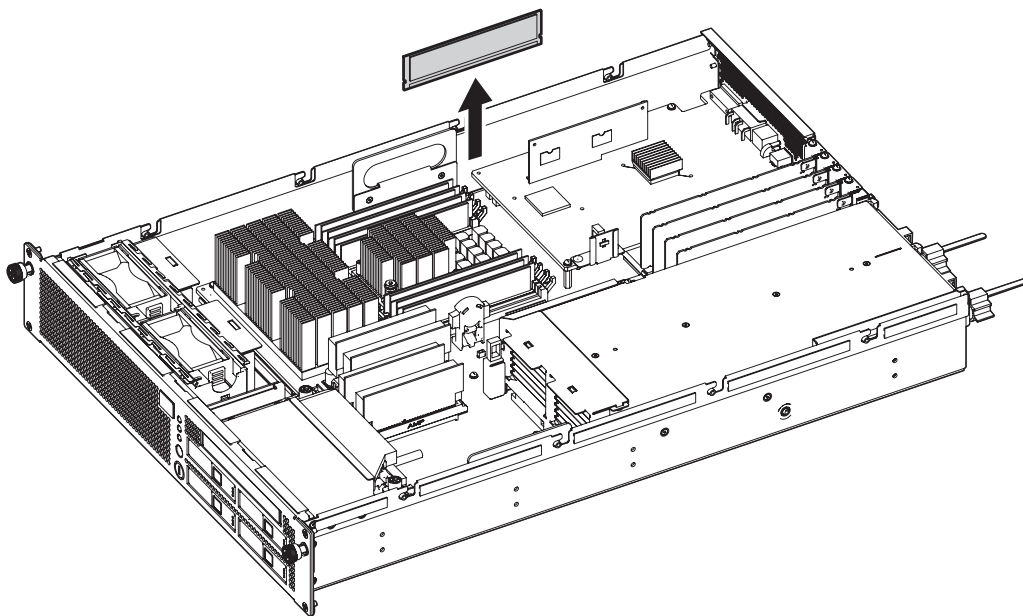
For details, see [Section 5.3.2, “Removing the Air Duct” on page 5-5](#).

---

## 7.2 Removing the DIMMs

1. Pull the DIMM eject levers outward to release the DIMM.
2. Pull the DIMM upwards to remove the DIMM from the socket.
3. Place the DIMM on a conductive mat.

**FIGURE 7-2** Removing the DIMMs



---

## 7.3 Installing the DIMMs

1. Push the DIMM evenly into the DIMM socket.
2. Push the DIMM eject levers inward to secure the DIMM in position.

When mounting DIMMs, align the indentation with the corresponding connector part.

---

## 7.4 Reassembling the Server

1. **Attach the air duct.**  
For details, see [Section 5.3.3, “Attaching the Air Duct”](#) on page 5-6.
2. **Attach the top cover.**  
For details, see [Section 5.2.2, “Attaching the Top Cover”](#) on page 5-4.
3. **Slide the server into the equipment rack and secure the stabilizer bar.**  
For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.
4. **Power on the server.**  
This procedure includes the steps of reconnecting the power cord, checking the LED status, and turning the mode switch on the operator panel to the Locked position. For details, see [Section 4.5.3.1, “Power-on by Using the XSCF Command”](#) on page 4-13.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the ok prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

5. **Check the hardware.**  
This procedure includes the steps for running a program to verify that all the components have been remounted and to start the Solaris OS.  
For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on page 4-15.





# Replacement and Installation of PCIe Cards

---

This chapter explains how to replace and install PCIe cards.

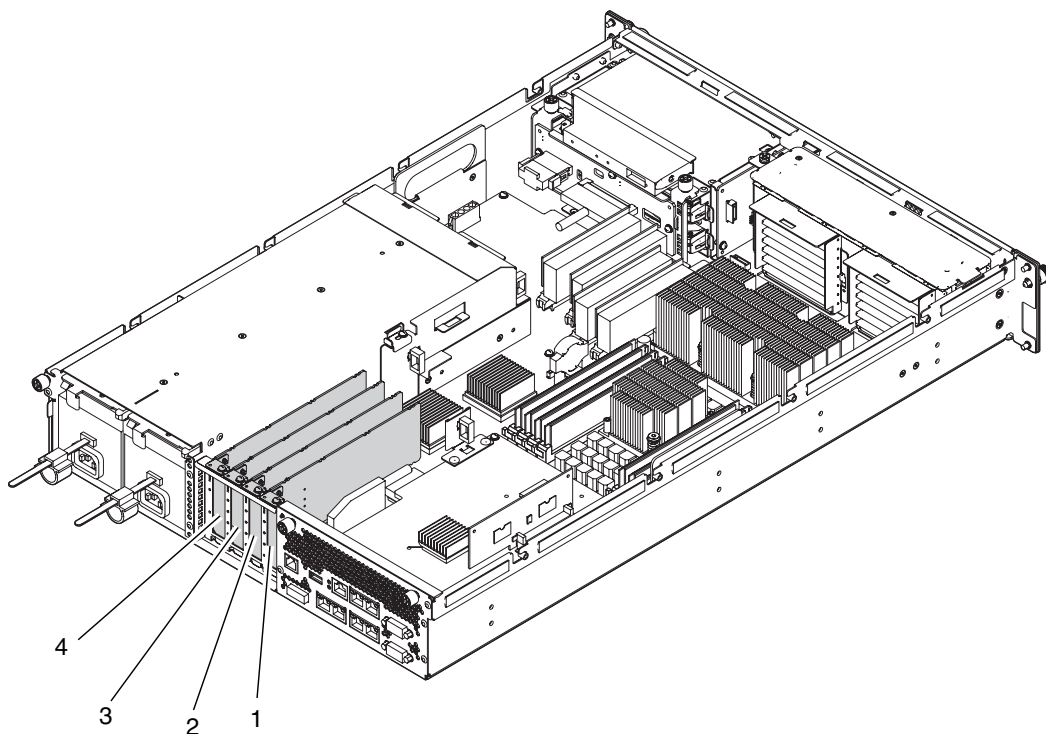
- [Section 8.1, “Accessing a PCIe Card” on page 8-3](#)
- [Section 8.2, “Removing a PCIe Card” on page 8-4](#)
- [Section 8.3, “Mounting a PCIe Card” on page 8-4](#)
- [Section 8.4, “Reassembling the Server” on page 8-5](#)

PCIe cards are hot replacement components.

The same methods as those for replacement are used for installation of PCIe cards.

FIGURE 8-1 shows the locations of the PCIe slots.

**FIGURE 8-1** PCIe Slot Locations



Location number	Component
1	PCIe slot (PCIe#0)
2	PCIe slot (PCIe#1)
3	PCIe slot (PCIe#2)
4	PCIe slot (PCIe#3)

---

## 8.1 Accessing a PCIe Card



---

**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.

---



---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions”](#) on page 1-1.

---

### 1. Power off the server.

This procedure includes the steps of turning the mode switch on the operator panel to the Service position, verifying that the POWER LED is off, and disconnecting the power cord. For details, see [Section 4.5.1, “Powering off the Server”](#) on page 4-11.

### 2. Slide the server out from the equipment rack.

For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack”](#) on page 5-1.



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

### 3. Remove the top cover.

For details, see [Section 5.2.1, “Removing the Top Cover”](#) on page 5-3.

---

## 8.2 Removing a PCIe Card

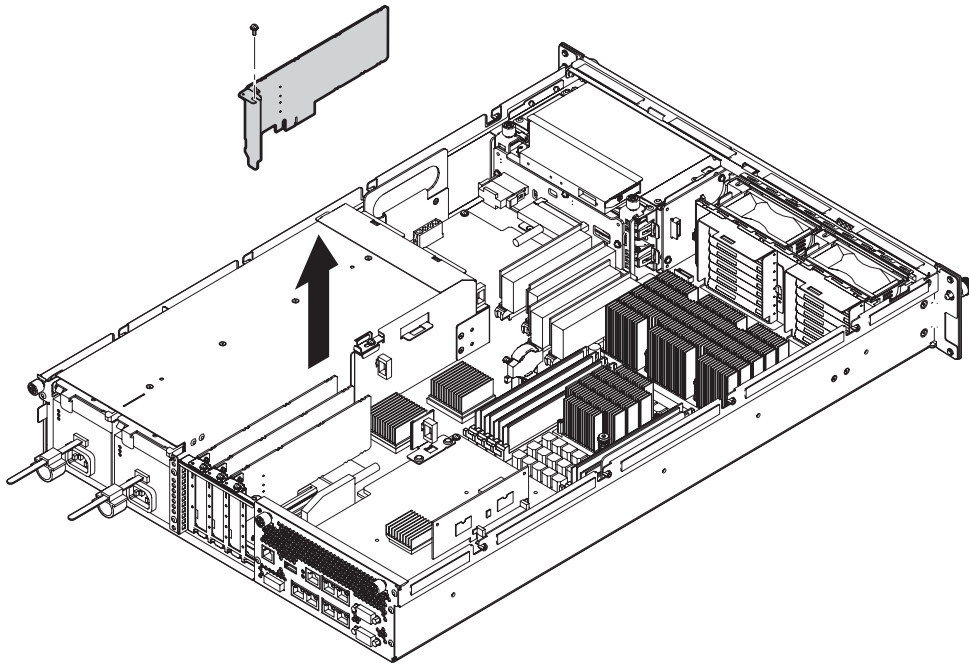
---

**Note** – If a new PCIe card is to be installed in an empty disk slot, remove the PCIe slot cover first.

---

1. Remove the one screw securing the PCIe card.
2. Pull a PCIe card straight up from the slot, and then place it on a conductive mat.

**FIGURE 8-2** Removing a PCIe card



---

## 8.3 Mounting a PCIe Card

1. Insert a PCIe card in a slot.

---

**Note** – A card must be firmly secured so that it is properly mounted.

---

2. **Install and tighten the one screw to secure the PCIe card in position.**

---

## 8.4 Reassembling the Server

1. **Attach the top cover.**

For details, see [Section 5.2.2, “Attaching the Top Cover”](#) on page 5-4.

2. **Slide the server into the equipment rack and secure the stabilizer bar.**

For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.

3. **Power on the server.**

This procedure includes the steps of reconnecting the power cord, checking the LED status, and turning the mode switch on the operator panel to the Locked position. For details, see [Section 4.5.3.1, “Power-on by Using the XSCF Command”](#) on page 4-13.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the ok prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

4. **Check the hardware.**

This procedure includes the steps for running a program to verify that all the components have been remounted and to start the Solaris OS.

For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on page 4-15.



## Replacement and Installation of a Hard Disk Drive (HDD)

---

This chapter explains how to replace and install a hard disk drive.

- [Section 9.1, “Accessing a Hard Disk Drive” on page 9-3](#)
- [Section 9.2, “Removing a Hard Disk Drive” on page 9-3](#)
- [Section 9.3, “Installing a Hard Disk Drive” on page 9-5](#)
- [Section 9.4, “Reassembling the Server” on page 9-5](#)

Hard disk drives are active/hot replacement components.

---

**Note** – Only when the disk mirroring software is used, a redundant configuration is created with the hard disk drive.

---

---

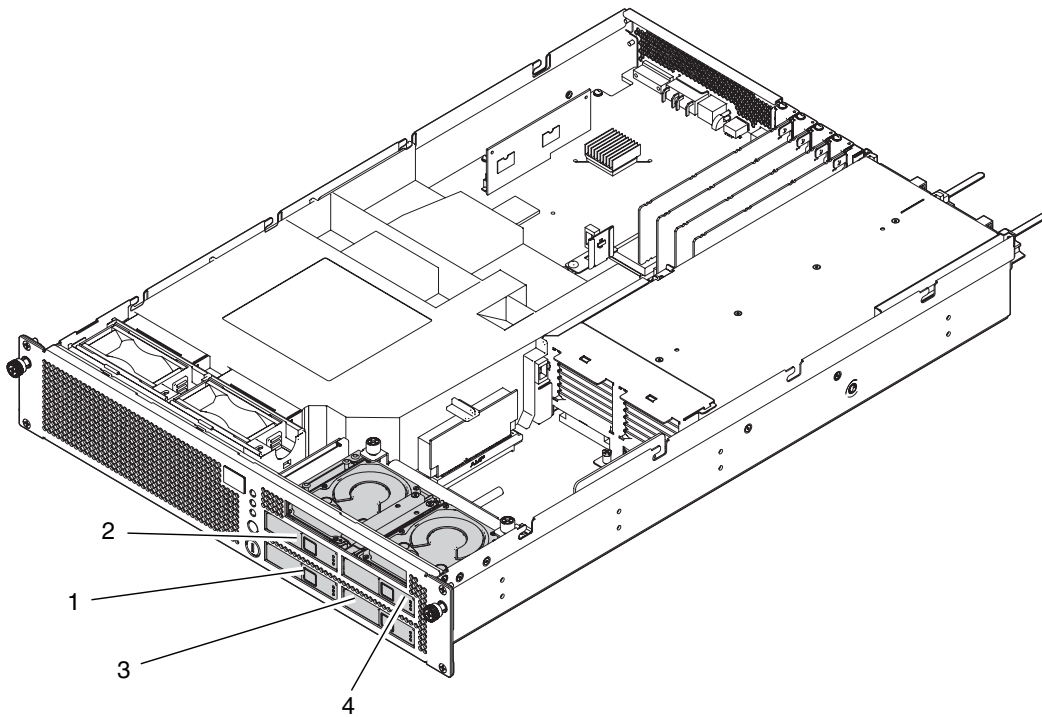
**Note** – If a hard disk drive is an unmirrored boot device, it must be replaced by using the cold replacement procedure. However, if a boot device can be disconnected by means of a Solaris OS function or disk mirroring software function, active replacement can also be performed. The procedure for disconnecting a hard disk drive varies depending on the software being used. For details, see the manuals for the relevant software.

---

The same methods as those for replacement are used for installation of a hard disk drive.

FIGURE 9-1 shows the locations of the hard disk drives.

**FIGURE 9-1** Hard Disk Drive Location



Location number	Component
1	Hard disk drive (HDD#0)
2	Hard disk drive (HDD#1)
3	Hard disk drive (HDD#2)
4	Hard disk drive (HDD#3)



---

## 9.1 Accessing a Hard Disk Drive



---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. [Section 1.1, “ESD Precautions” on page 1-1.](#)

---

- Release the hard disk drive from the domain.

This procedure includes the steps of using the `cfgadm` command to check the `Ap_Id`, and for releasing the hard disk drive. For details, see [Section 4.3.1, “Releasing a FRU from a Domain” on page 4-5.](#)

---

## 9.2 Removing a Hard Disk Drive

---

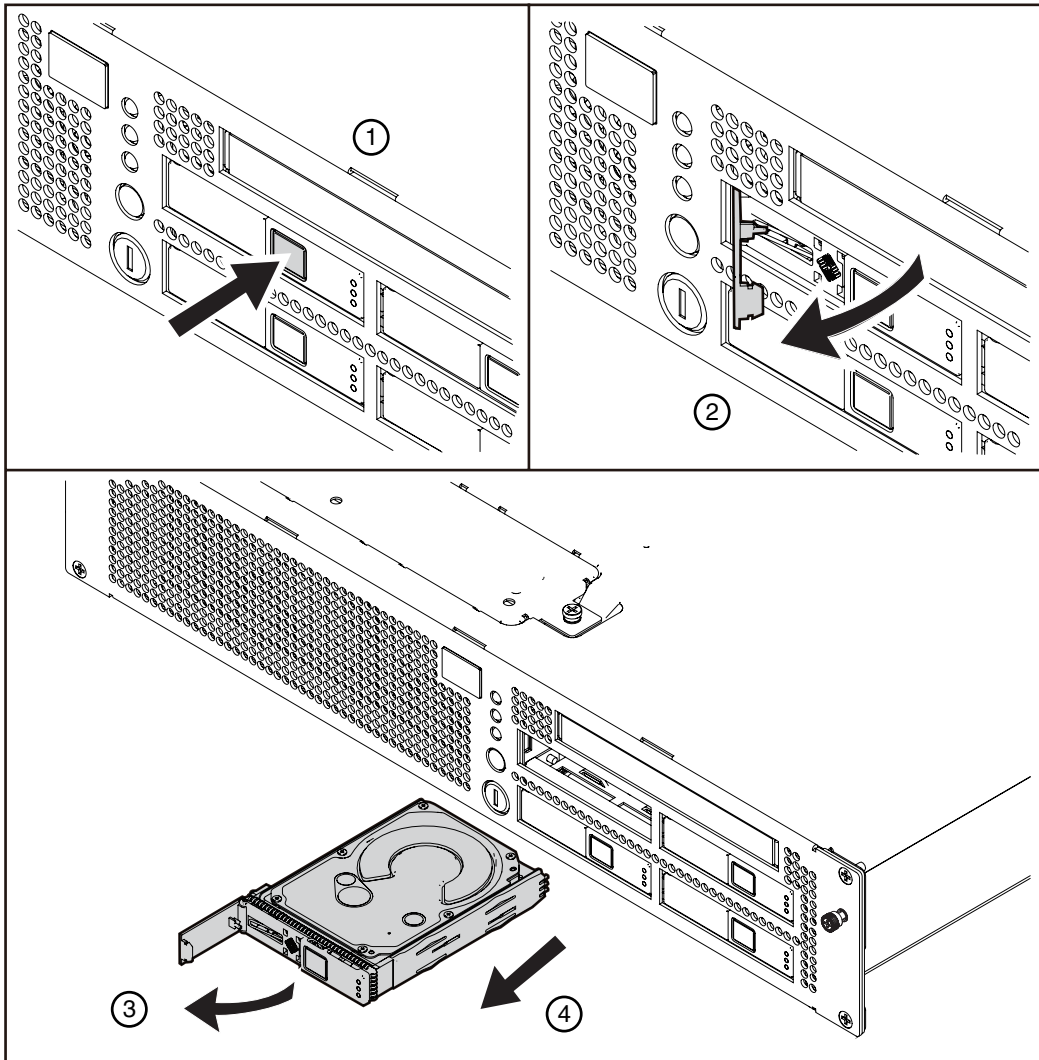
**Note** – If a new hard disk drive is to be installed in an empty disk slot, remove the HDD filler panel first.

---

1. Push the square button on the front of the hard disk drive (1 in [FIGURE 9-2](#)) to release the eject/lock lever (2 in [FIGURE 9-2](#)).
2. Pull the eject/lock lever (3 in [FIGURE 9-2](#)) so that the hard disk drive is pulled straight out from the unit (4 in [FIGURE 9-2](#)).

3. Remove the hard disk drive and place it on a conductive mat.

FIGURE 9-2 Removing a Hard Disk Drive



---

## 9.3 Installing a Hard Disk Drive



---

**Caution** – If a hard disk drive cannot be inserted smoothly, do not forcibly push the hard disk drive into the slot. If the HDD is forcibly inserted despite the presence of any obstruction in a slot or any problems with the connector pin, serious damage may result.

---



---

**Caution** – Do not insert a hard disk drive into a slot when the eject/lock lever is closed. If an HDD is inserted in this condition, it stops halfway and becomes difficult to pull out.

---

1. Align the hard disk drive with the slot, and then push the hard disk drive in until it stops.
2. Fasten the eject/lock lever.

---

## 9.4 Reassembling the Server

1. **Configure the hard disk drive in the domain.**

This procedure includes the steps of using the `cfgadm` command to connect the hard disk drive to the domain, and for verifying that it has been added to the domain. For details, see [Section 4.3.3, “Configuring a FRU in a Domain”](#) on [page 4-6](#).

2. **Check the hardware.**

This procedure includes the steps of running a program to verify that all the components have been remounted and to start the Solaris OS.

For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on [page 4-15](#).

3. **Verify the state of the LED indicator of the hard disk drive.**

For information on the LED status, see [TABLE 2-3](#) to [TABLE 2-5](#).



# Replacing the Hard Disk Drive Backplane

---

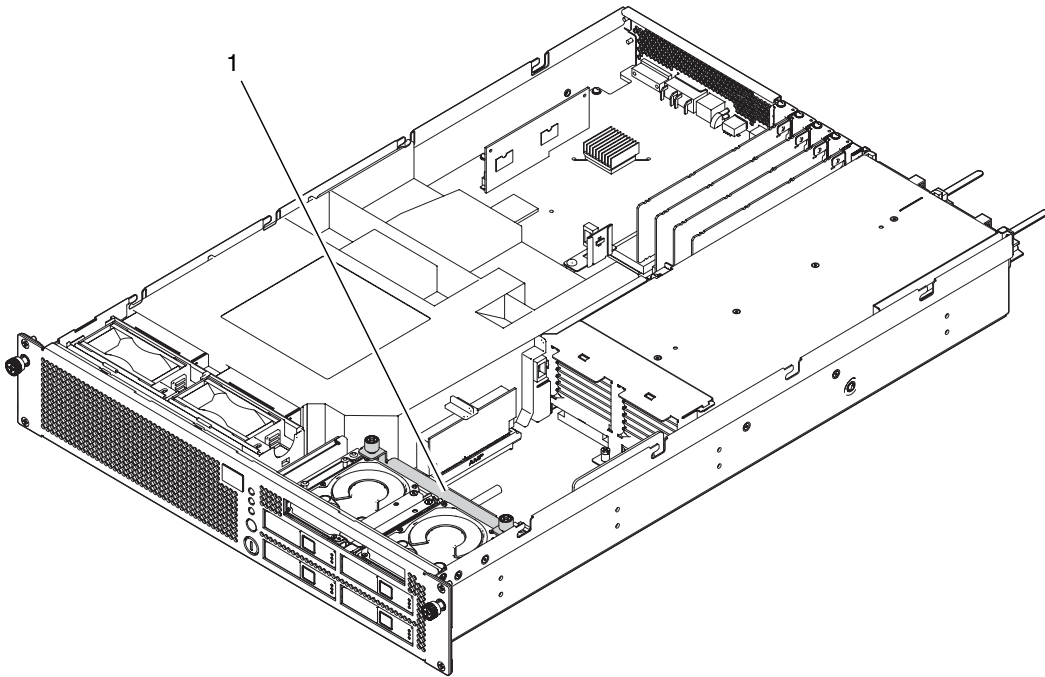
This chapter explains how to replace the hard disk drive backplane.

- [Section 10.1, “Accessing the Hard Disk Drive Backplane” on page 10-2](#)
- [Section 10.2, “Removing the Hard Disk Drive Backplane” on page 10-3](#)
- [Section 10.3, “Mounting the Hard Disk Drive Backplane” on page 10-5](#)
- [Section 10.4, “Reassembling the Server” on page 10-6](#)

The hard disk drive backplane is a cold replacement component. The entire server must be powered off and the power cords must be disconnected to replace the hard disk drive backplane.

FIGURE 10-1 shows the location of the hard disk drive backplane.

FIGURE 10-1 Hard Disk Drive Backplane Location



Location number	Component
1	Hard disk drive backplane (HDDBP#0)

## 10.1 Accessing the Hard Disk Drive Backplane



**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.

---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. [Section 1.1, “ESD Precautions” on page 1-1.](#)

---

**1. Power off the server.**

This procedure includes the steps of turning the mode switch on the operator panel to the Service position, verifying that the POWER LED is off, and disconnecting the power cord. For details, see [Section 4.5.1, “Powering off the Server” on page 4-11.](#)

**2. Slide the server out from the equipment rack.**

For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack” on page 5-1.](#)



---

**Note** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

**3. Remove the top cover.**

For details, see [Section 5.2.1, “Removing the Top Cover” on page 5-3.](#)

**4. Remove the air duct from the server.**

For details, see [Section 5.3.2, “Removing the Air Duct” on page 5-5.”](#)

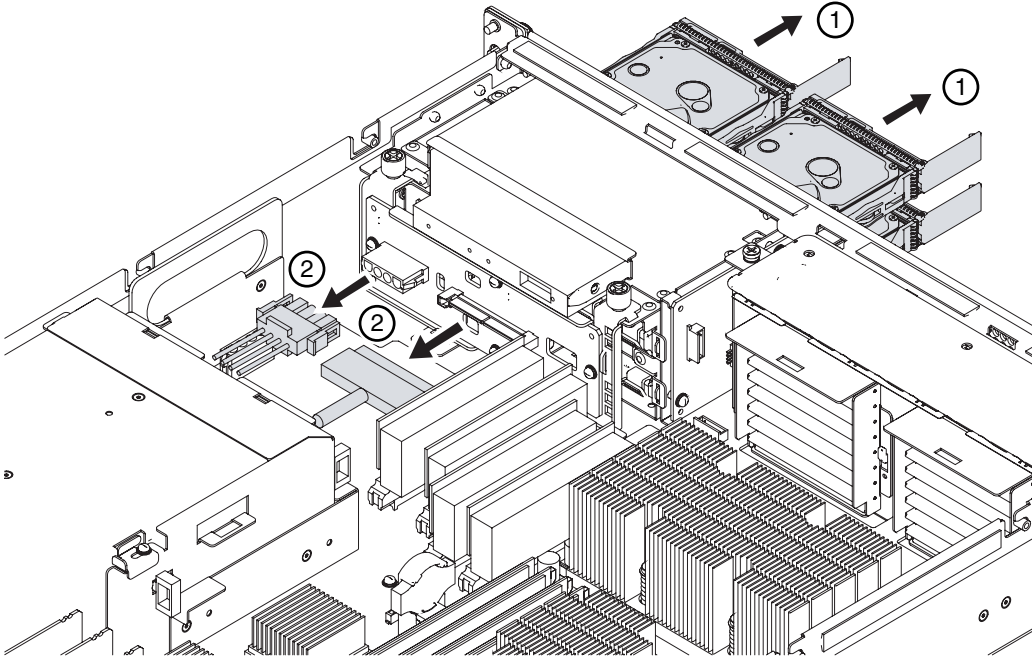
---

## 10.2 Removing the Hard Disk Drive Backplane

- 1. Pull out all the hard disk drives (including HDD filler panels) from the server by several centimeters (1 in [FIGURE 10-2](#)).**

2. Remove the two cables from the rear of the hard disk drive backplane (2 in [FIGURE 10-2](#)).

**FIGURE 10-2** Removing the Cables of the Hard Disk Drive Backplane

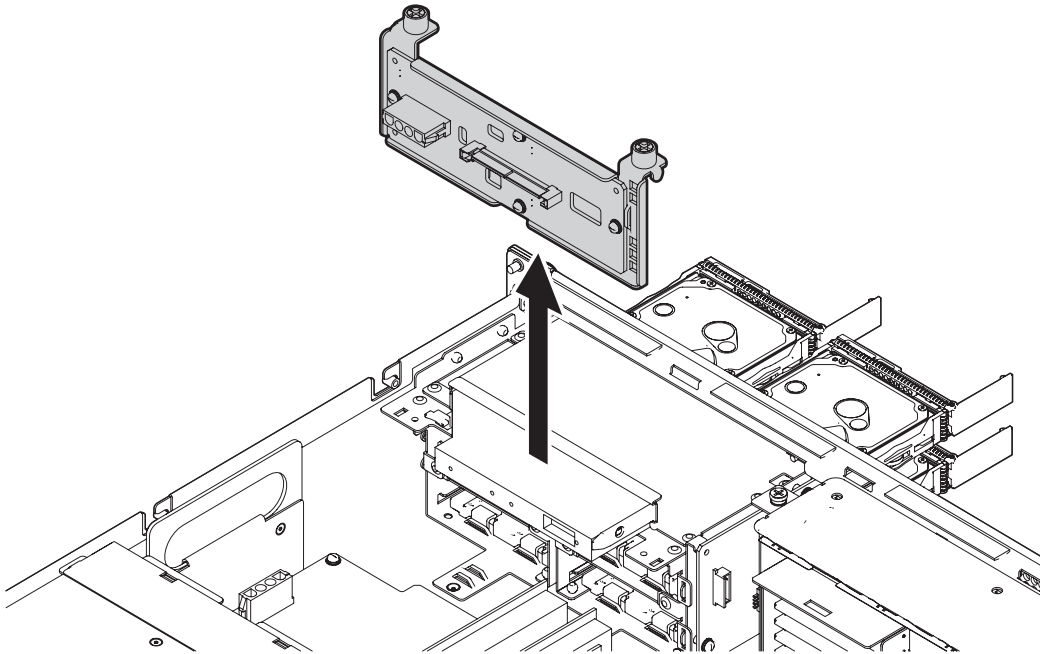


3. Remove the cables connected to the CD-RW/DVD-RW drive unit.
4. Pull the CD-RW/DVD-RW drive unit out by several centimeters.  
For details, see [Section 11.2, “Removing the CD-RW/DVD-RW Drive Unit”](#) on [page 11-3](#).



5. Loosen the two screws to remove the hard disk drive backplane.

**FIGURE 10-3** Removing the Hard Disk Drive Backplane



6. Place the hard disk drive backplane on a conductive mat.

---

## 10.3 Mounting the Hard Disk Drive Backplane

1. Mount the hard disk drive backplane.
2. Tighten the two screws to secure the hard disk drive backplane.
3. Secure the two cables to the rear of the hard disk drive backplane.



---

**Caution** – Do not forcibly mount the hard disk drive in a slot. Forcibly pushing the component in a slot may damage the component or the server.

---

**4. Mount the hard disk drives.**

For details, see [Section 9.3, “Installing a Hard Disk Drive”](#) on page 9-5.

**5. Mount the CD-RW/DVD-RW drive unit.**

For details, see [Section 11.3, “Mounting the CD-RW/DVD-RW Drive Unit”](#) on page 11-4.

---

## 10.4 Reassembling the Server

**1. Attach the air duct.**

For details, see [Section 5.3.3, “Attaching the Air Duct”](#) on page 5-6.

**2. Attach the top cover.**

For details, see [Section 5.2.2, “Attaching the Top Cover”](#) on page 5-4.

**3. Slide the server into the equipment rack and secure the stabilizer bar.**

For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.

**4. Power on the server.**

This procedure includes the steps of reconnecting the power cord, checking the LED status, and turning the mode switch on the operator panel to the Locked position. For details, see [Section 4.5.3.1, “Power-on by Using the XSCF Command”](#) on page 4-13.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the ok prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

**5. Check the hardware.**

This procedure includes the steps of running a program to verify that all the components have been remounted and to start the Solaris OS.

For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on page 4-15.

## CD-RW /DVD-RW Drive Unit (DVDU) Replacement

---

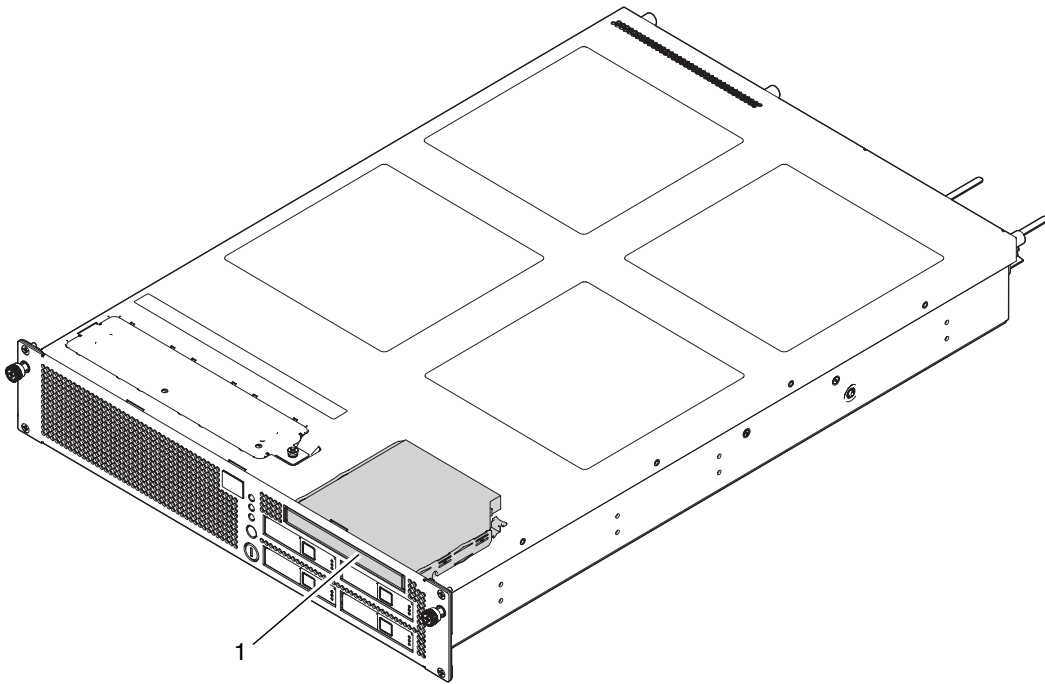
This chapter explains how to replace the CD-RW/DVD-RW driver unit.

- [Section 11.1, “Accessing the CD-RW/DVD-RW Drive Unit” on page 11-2](#)
- [Section 11.2, “Removing the CD-RW/DVD-RW Drive Unit” on page 11-3](#)
- [Section 11.3, “Mounting the CD-RW/DVD-RW Drive Unit” on page 11-4](#)
- [Section 11.4, “Reassembling the Server” on page 11-5](#)

CD-RW/DVD-RW drive unit is a cold replacement component. The entire server must be powered off and the power cords must be disconnected to replace the CD-RW/DVD-RW drive unit.

FIGURE 11-1 shows the location of the CD-RW/DVD-RW drive unit.

**FIGURE 11-1** Location of the CD-RW/DVD-RW Drive Unit



Location number	Component
1	CD-RW/DVD-RW drive unit (DVDU)

## 11.1 Accessing the CD-RW/DVD-RW Drive Unit



**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.



---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions” on page 1-1](#).

---

**1. Power off the server.**

This procedure includes the steps of turning the mode switch on the operator panel to the Service position, verifying that the POWER LED is off, and disconnecting the power cord. For details, see [Section 4.5.1, “Powering off the Server” on page 4-11](#).

**2. Slide the server out from the equipment rack.**

For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack” on page 5-1](#).



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

**3. Remove the top cover.**

For details, see [Section 5.2.1, “Removing the Top Cover” on page 5-3](#).

---

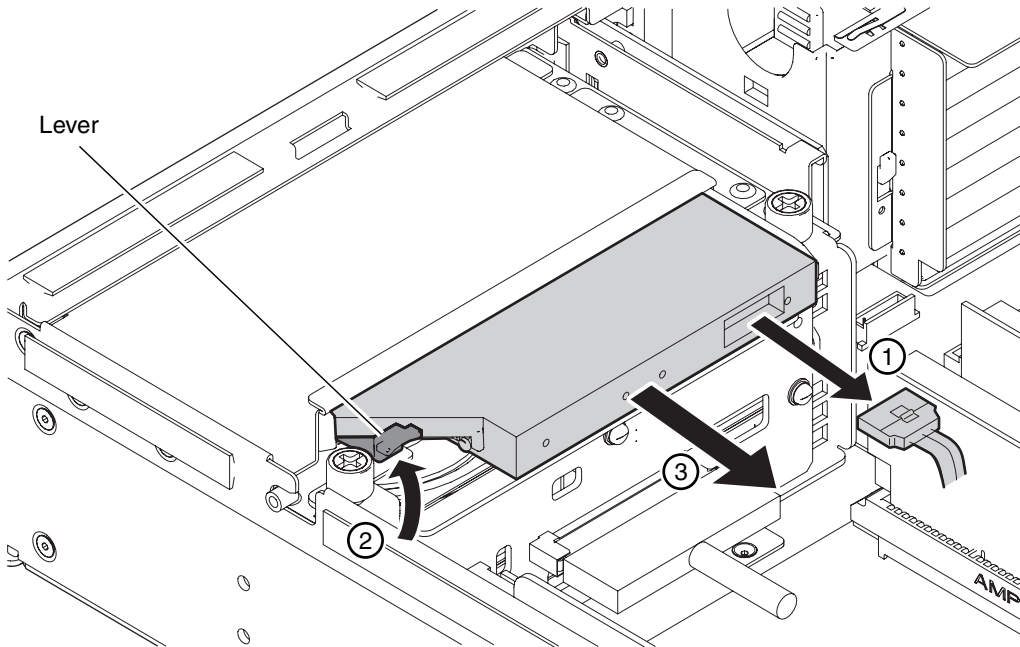
## 11.2 Removing the CD-RW /DVD-RW Drive Unit

**1. Remove the cables connected to the CD-RW/DVD-RW drive unit (1 in [FIGURE 11-2](#)).**

At this time, disconnect the cable while pressing the tab on the cable.

2. While pushing the black lever upward (2 in [FIGURE 11-2](#)), push the CD-RW/DVD-RW drive unit toward the front side to remove it from the server (3 in [FIGURE 11-2](#)).
3. Place the drive unit on the conductive mat.

**FIGURE 11-2** Removing the CD-RW/DVD-RW Drive Unit



## 11.3 Mounting the CD-RW/DVD-RW Drive Unit



**Caution** – Do not forcibly push the CD-RW/DVD-RW drive unit to insert in the slot. Forcibly pushing the component in a slot may damage the component or the server.

1. Align the CD-RW/DVD-RW drive unit with the drive slot, and then slowly push the unit in until it locks in position.

2. Connect the cable for the CD-RW/DVD-RW drive unit.

---

## 11.4 Reassembling the Server

1. **Attach the top cover.**

For details, see [Section 5.2.2, “Attaching the Top Cover”](#) on page 5-4.

2. **Slide the server into the equipment rack and secure the stabilizer bar.**

For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.

3. **Power on the server.**

This procedure includes the steps of reconnecting the power cords and turning the mode switch on the operator panel to the Locked position. For details, see [Section 4.5.3.1, “Power-on by Using the XSCF Command”](#) on page 4-13.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the ok prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

4. **Check the hardware.**

This procedure includes the steps for running a program to verify that all the components have been remounted and to start the Solaris OS.

For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on page 4-15.





# Power Supply Unit Replacement

---

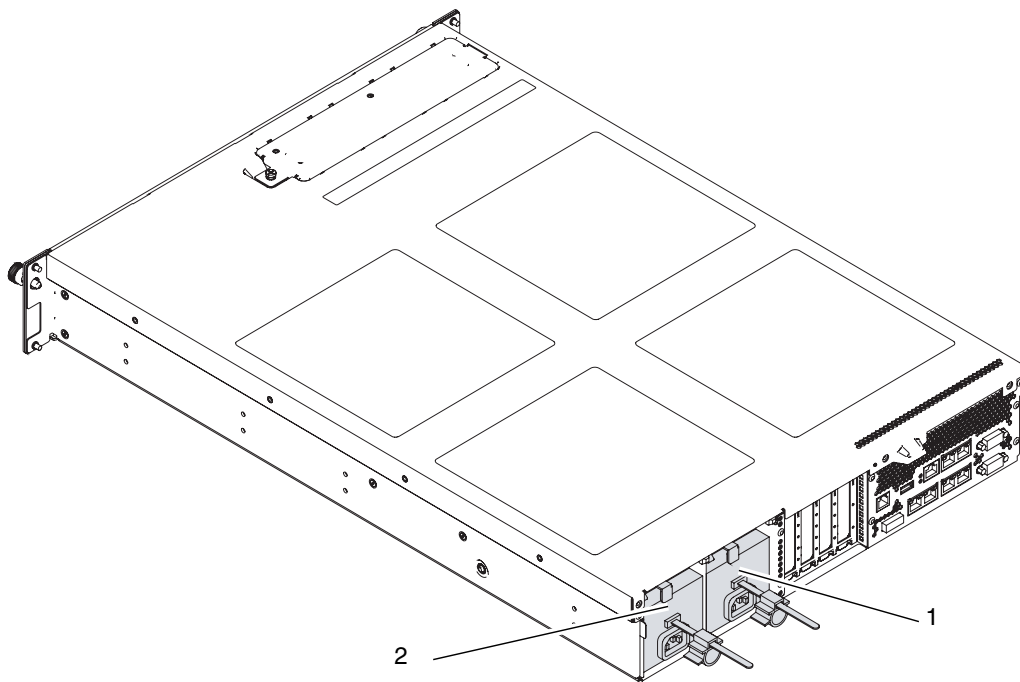
This chapter explains how to replace a power supply unit.

- [Section 12.1, “Accessing a Power Supply Unit” on page 12-3](#)
- [Section 12.2, “Removing the Power Supply Unit” on page 12-3](#)
- [Section 12.3, “Mounting the Power Supply Unit” on page 12-5](#)
- [Section 12.4, “Reassembling the Server” on page 12-5](#)

The power supply unit is an active/hot replacement component. To guarantee the redundant configuration, only one power supply unit must be replaced at a time.

FIGURE 12-1 shows the locations of power supply units.

**FIGURE 12-1** Locations of Power Supply Units



Location number	Component
1	Power supply unit (PSU#0)
2	Power supply unit (PSU#1)

---

## 12.1 Accessing a Power Supply Unit

---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions”](#) on page 1-1.

---

1. From the XSCF shell prompt, use the `replacefru` command to disable the power supply unit to be removed.

```
XSCF> replacefru
```

The `replacefru` command is a menu-driven interactive command. The `replacefru` continues operating while the power supply unit is removed. Afterwards, it performs the power supply unit test. For details, see [Section 4.4.1, “FRU Removal and Replacement”](#) on page 4-8.

2. Loosen the thumbscrew of the cable management arm that is located on the right side when you are facing the rear of the server.
3. Pull out the cable management arm while keeping it from coming into contact with the power supply unit.

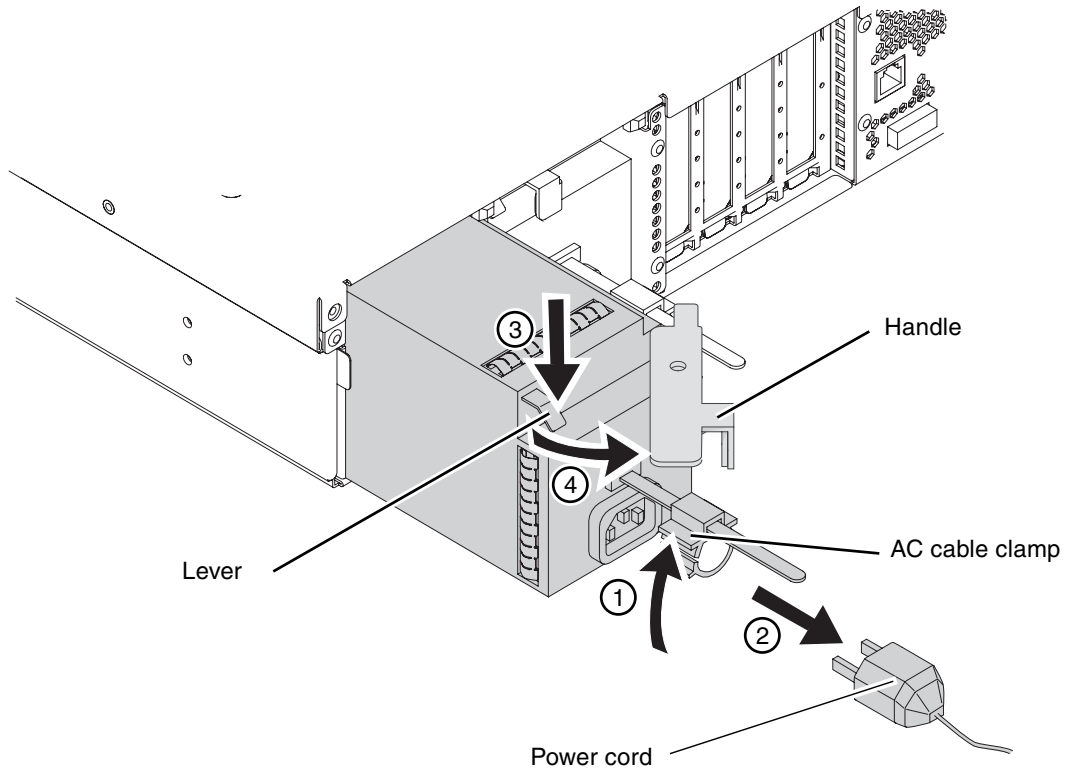
---

## 12.2 Removing the Power Supply Unit

1. Verify that the CHECK LED of the power supply unit is blinking and the DC LED is off.
2. Release the lock of the AC cable clamp (1 in [FIGURE 12-2](#)).
3. Remove the power cord from the power supply unit (2 in [FIGURE 12-2](#)).

4. While pressing the lever (3 in [FIGURE 12-2](#)), pull the handle outward (4 in [FIGURE 12-2](#)).

**FIGURE 12-2** Removing the Power Supply Unit



5. With one hand supporting the bottom of the power supply, remove the power supply unit.
6. Place the power supply unit on a conductive mat.

---

## 12.3 Mounting the Power Supply Unit



---

**Caution** – Do not forcibly push the power supply unit into the slot. Forcibly pushing the component in a slot may damage the component or the server.

---

1. **Align the top of the unit with the top of the slot.**  
Doing so prevents the bottom of the slot from cutting the power cord at the bottom of the unit.
2. **Set the handle so that it is perpendicular to the server, and then push the power supply unit into the slot.**
3. **Insert the power supply unit until it reaches the predetermined position, and then return the handle to its original position.**
4. **Secure the power cord with the AC cable clamp.**

---

## 12.4 Reassembling the Server

- From the XSCF shell prompt, use the `showhardconf` command to verify that the new power supply unit has been installed.

```
XSCF> showhardconf
```

For details, see [Section 4.4.2, “Verifying the Hardware Operation”](#) on page 4-10.



# Fan Unit Replacement

---

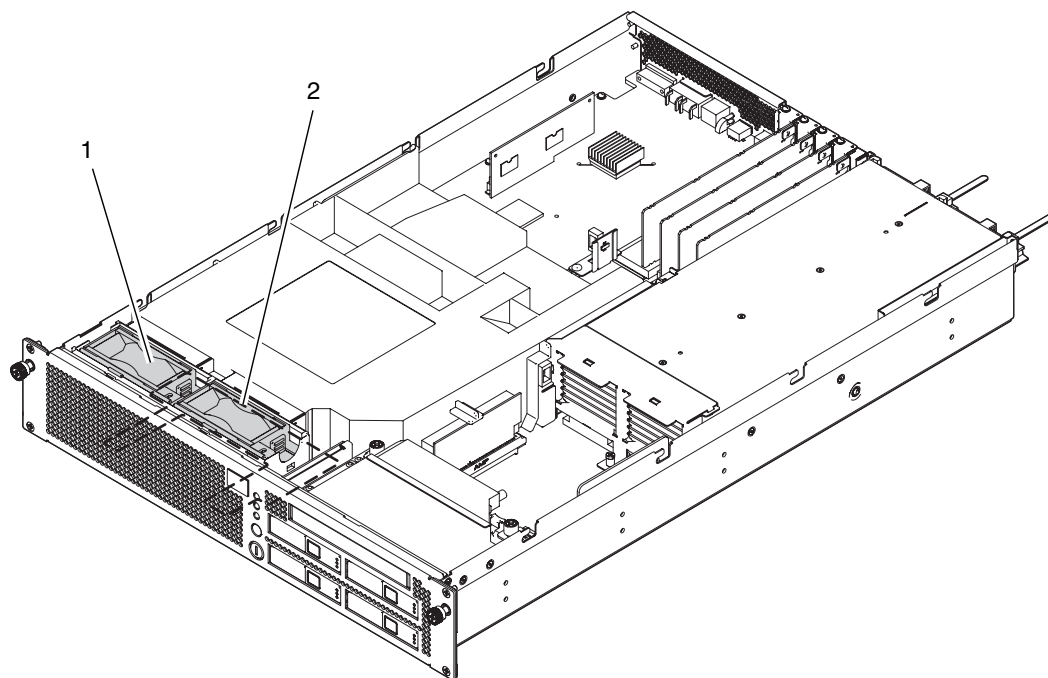
This chapter explains how to replace a fan unit.

- [Section 13.1, “Accessing a Fan Unit” on page 13-3](#)
- [Section 13.2, “Removing a Fan Unit” on page 13-3](#)
- [Section 13.3, “Mounting a Fan Unit” on page 13-5](#)
- [Section 13.4, “Reassembling the Server” on page 13-5](#)

A fan unit is an active/hot replacement component. To guarantee the redundant configuration, only one fan unit must be replaced at a time.

FIGURE 13-1 indicates the location of the fan unit.

**FIGURE 13-1** Fan Unit Locations



Location number	Component
1	Fan unit (FAN_A#0)
2	Fan unit (FAN_A#1)



---

## 13.1 Accessing a Fan Unit



---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions”](#) on page 1-1.

---

1. From the XSCF shell prompt, use the `replacefru` command to disable the fan unit to be removed.

```
XSCF> replacefru
```

The `replacefru` command is a menu-driven interactive command. The `replacefru` continues operating while the fan unit is removed. Then later, it performs the fan unit test. For details, see [Section 4.4.1, “FRU Removal and Replacement”](#) on page 4-8.



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

2. Slide the server out from the equipment rack.  
For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack”](#) on page 5-1.
3. Remove the fan cover.  
For details, see [Section 5.4.1, “Removing the Fan Cover”](#) on page 5-7.

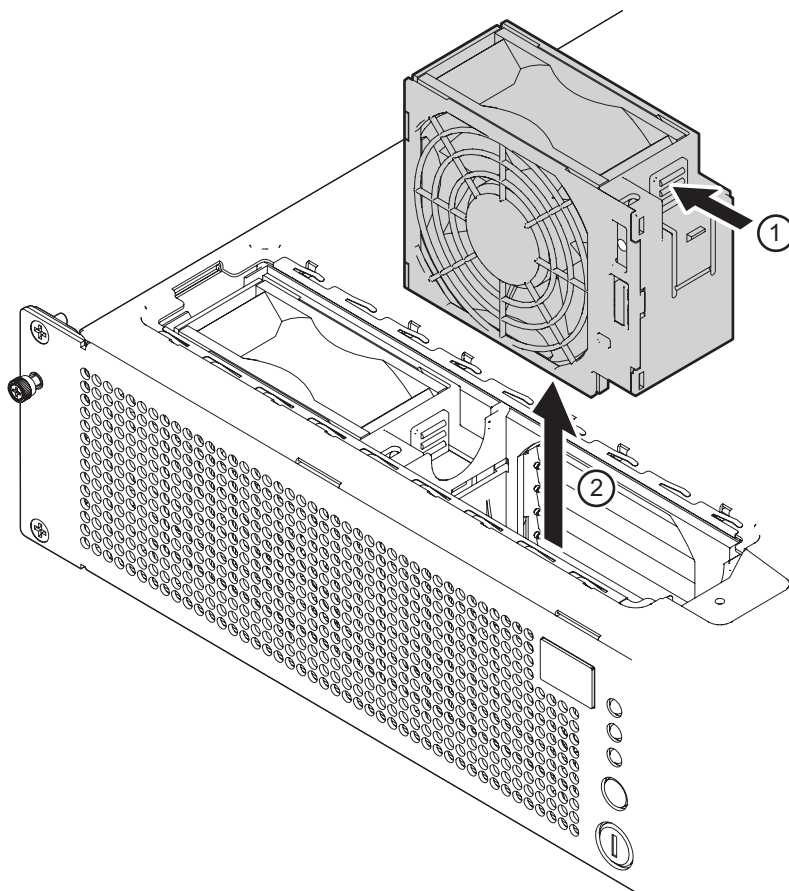
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## 13.2 Removing a Fan Unit

1. While pressing the latch (1 in [FIGURE 13-2](#)), lift the fan unit (2 in [FIGURE 13-2](#)).

2. Remove the fan unit from the server, and place it on a conductive mat.

**FIGURE 13-2** Removing a Fan Unit



---

## 13.3 Mounting a Fan Unit



---

**Caution** – Do not forcibly mount a fan unit in a slot. Forcibly pushing a fan unit in a slot may damage the fan unit or the server.

---

1. Adjust the position of the fan unit so that its latch is on the right when you are facing the front of the server.
2. Insert the fan unit in the slot.

---

## 13.4 Reassembling the Server

1. Attach the fan cover.  
For details, see [Section 5.4.2, “Attaching the Fan Cover”](#) on page 5-8.
2. Slide the server into the equipment rack and secure the stabilizer bar.  
For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.
3. From the XSCF shell prompt, use the `showhardconf` command to verify that the new fan unit has been installed.

```
XSCF> showhardconf
```

For details, see [Section 4.4.2, “Verifying the Hardware Operation”](#) on page 4-10.



# Fan Backplane Replacement

---

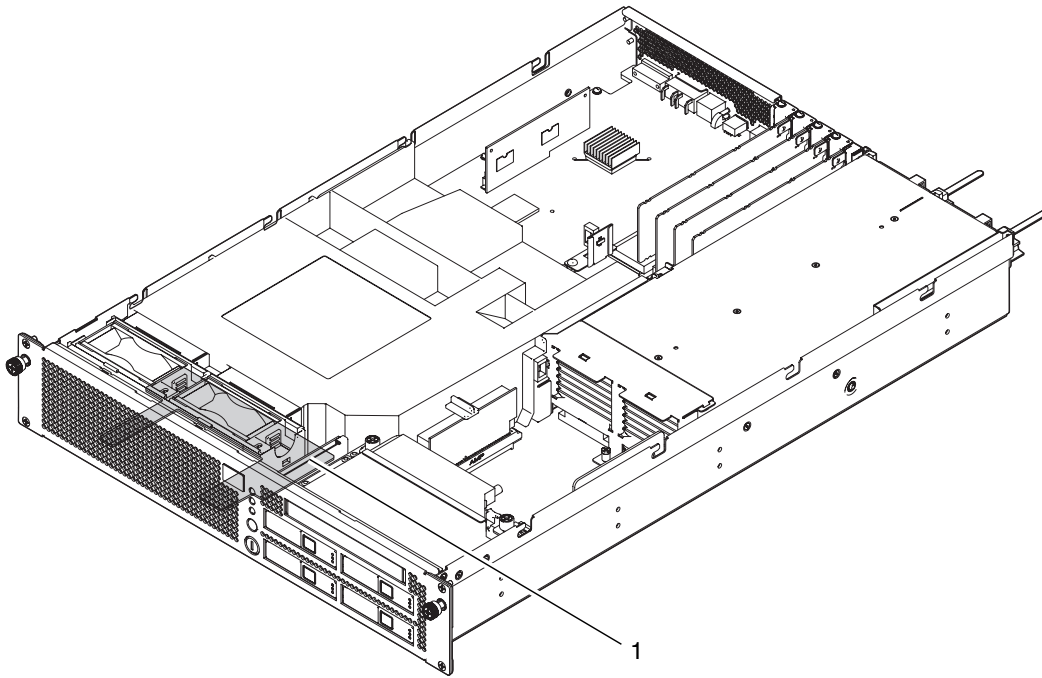
This chapter explains how to replace the fan backplane.

- [Section 14.1, “Accessing the Fan Backplane” on page 14-2](#)
- [Section 14.2, “Removing the Fan Backplane” on page 14-5](#)
- [Section 14.3, “Mounting the Fan Backplane” on page 14-6](#)
- [Section 14.4, “Reassembling the Server” on page 14-6](#)

The fan backplane is a cold replacement component. The entire server must be powered off and the power cords must be disconnected to replace the fan backplane.

FIGURE 14-1 shows the location of the fan backplane.

FIGURE 14-1 Fan Backplane Location



Location number	Component
1	Fan backplane (FANBP_B)

## 14.1 Accessing the Fan Backplane



**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.



---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions” on page 1-1](#).

---

**1. Power off the server.**

This procedure includes the steps of turning the mode switch on the operator panel to the Service position, verifying that the POWER LED is off, and disconnecting the power cord. For details, see [Section 4.5.1, “Powering off the Server” on page 4-11](#).

**2. Slide the server out from the equipment rack.**

For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack” on page 5-1](#).



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

**3. Remove the top cover.**

For details, see [Section 5.2.1, “Removing the Top Cover” on page 5-3](#).

**4. Remove the air duct from the server.**

For details, see [Section 5.3.2, “Removing the Air Duct” on page 5-5](#).

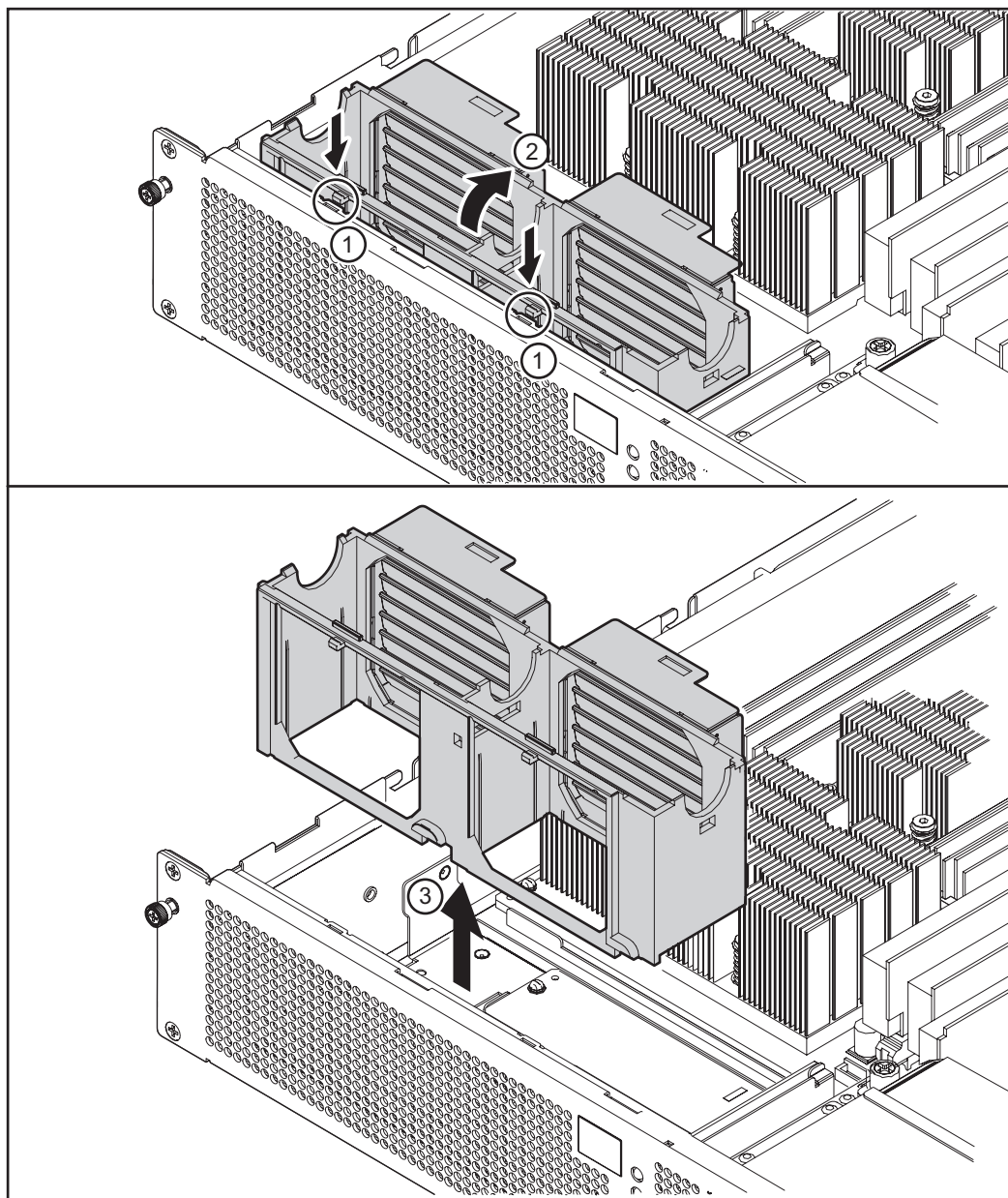
**5. Removing the fan units.**

For details, see [Section 13.2, “Removing a Fan Unit” on page 13-3](#).

**6. Press on the projections to remove the two tabs (1 in [FIGURE 14-2](#)), and incline the unit diagonally backward (2 in [FIGURE 14-2](#)).**

7. Pull the fan cage upward to remove it (3 in [FIGURE 14-2](#)).

**FIGURE 14-2** Removing the Fan Cage



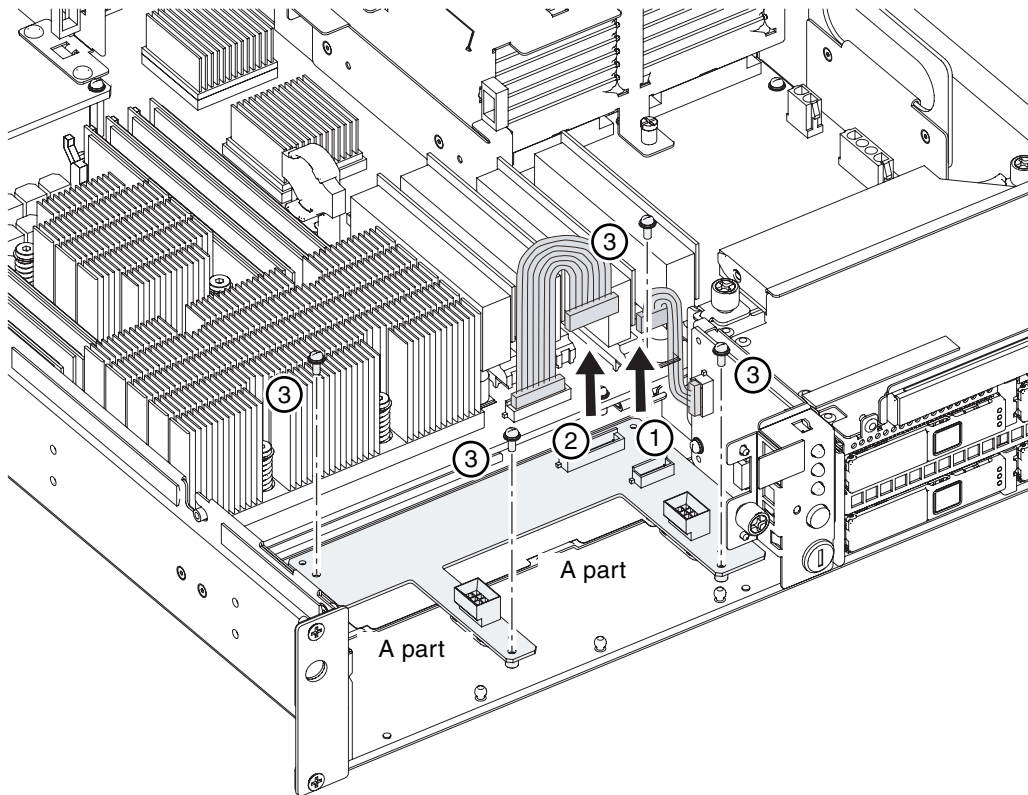


---

## 14.2 Removing the Fan Backplane

1. Remove the signal cable for the operator panel (1 in [FIGURE 14-3](#)).  
The cable is on the right side of the fan backplane.
2. Remove the signal cable connector for the motherboard unit (2 in [FIGURE 14-3](#)).  
The cable connector is on the rear side of the fan backplane.
3. Remove the four screws securing the fan backplane (3 in [FIGURE 14-3](#)).

**FIGURE 14-3** Removing the Fan Backplane



4. Remove the fan backplane from the server, and place it on a conductive mat.

---

## 14.3 Mounting the Fan Backplane

1. **Place the fan backplane on the bottom of the chassis.**

Adjust the fan backplane so that it is level and it does not catch on any cables.

2. **Tighten the four screws to secure the fan backplane in position.**

3. **Connect the signal cable for the operator panel.**

The cable is on the right side of the fan backplane.

4. **Mount the signal cable connector for the motherboard unit.**

The cable connector is to be mounted on the rear side of the fan backplane.

---

## 14.4 Reassembling the Server

1. **Mount the fan cage.**

Set the button of the fan cage at the A part in [FIGURE 14-3](#), and insert the fan cage projections in the tabs (1 in [FIGURE 14-1](#)).

2. **Mount the fan units.**

For details, see [Section 13.3, “Mounting a Fan Unit”](#) on page 13-5.

3. **Attach the air duct to the server.**

For details, see [Section 5.3.3, “Attaching the Air Duct”](#) on page 5-6.

4. **Attach the top cover.**

For details, see [Section 5.2.2, “Attaching the Top Cover”](#) on page 5-4.

5. **Slide the server into the equipment rack and secure the stabilizer bar.**

For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.

6. **Power on the server.**

This procedure includes the steps of reconnecting the power cord, checking the LED status, and turning the mode switch on the operator panel to the Locked position. For details, see [Section 4.5.3.1, “Power-on by Using the XSCF Command”](#) on page 4-13.

---

**Note** – If automatic startup of the Solaris OS is specified, use the `sendbreak -d domain_id` command of the XSCF shell to display the ok prompt after the display console banner is displayed but before the system starts booting the Solaris OS.

---

## 7. Check the hardware.

This procedure includes the steps of running a program to verify that all the components have been remounted and starting the Solaris OS.

For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on page 4-15.



## Operator Panel Replacement

---

This chapter explains how to replace the operator panel.

- [Section 15.1, “Accessing the Operator Panel” on page 15-3](#)
- [Section 15.2, “Removing the Operator Panel” on page 15-4](#)
- [Section 15.3, “Mounting the Operator Panel” on page 15-5](#)
- [Section 15.4, “Reassembling the Server” on page 15-5](#)

The operator panel is a cold replacement component. The entire server must be powered off and the power cords must be disconnected to replace the operator panel.



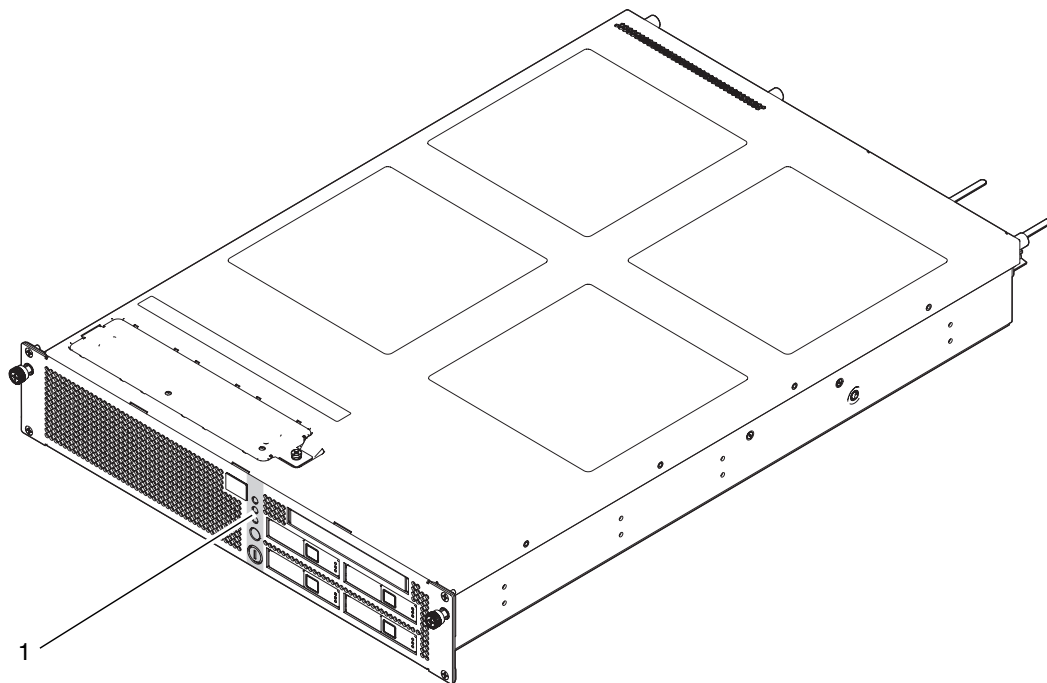
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**Caution** – If the motherboard unit and operator panel are replaced at the same time, the server may fail to operate correctly. Before starting the replacement of the next FRU, execute the `showhardconf` or `showstatus` command to verify that the component replaced earlier is operating correctly.

---

FIGURE 15-1 shows the location of the operator panel.

**FIGURE 15-1** Operator Panel Location



Location number	Component
1	Operator panel (OPNL)

---

## 15.1 Accessing the Operator Panel



---

**Caution** – There is a risk of electrical failure if the power cords are not disconnected. All the power cords must be disconnected to completely cut the power to the server.

---



---

**Caution** – To ensure that you and bystanders are not exposed to harm and to prevent damage to the system, observe the ESD safety precautions. See [Section 1.1, “ESD Precautions”](#) on page 1-1.

---

### 1. Power off the server.

This procedure includes the steps of turning the mode switch on the operator panel to the Service position, verifying that the POWER LED is off, and disconnecting the power cord. For details, see [Section 4.5.1, “Powering off the Server”](#) on page 4-11.

### 2. Slide the server out from the equipment rack.

For details, see [Section 5.1.1, “Sliding the Server Out from the Equipment Rack”](#) on page 5-1.



---

**Caution** – To prevent the equipment rack from tipping over, you must deploy the antitilt feature, if applicable, before you slide the server out of the equipment rack.

---

---

**Note** – When the cable management arm is not mounted, remove the cable ties that fix the PCI cable to the rear of the server, and slide the server out.

---

### 3. Remove the top cover.

For details, see [Section 5.2.1, “Removing the Top Cover”](#) on page 5-3.

### 4. Remove the air duct from the server.

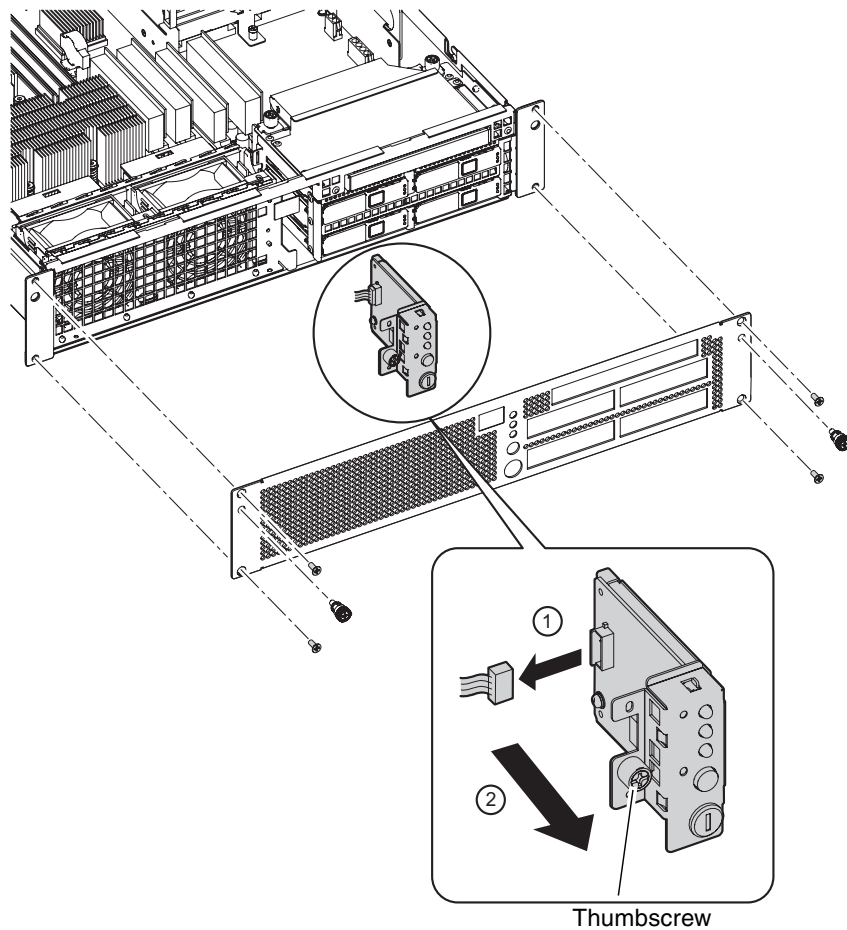
For details, see [Section 5.3.2, “Removing the Air Duct”](#) on page 5-5.

### 5. Remove the four screws on the front panel, and then remove the front panel.

## 15.2 Removing the Operator Panel

1. Disconnect the signal cable from the operator pane (1 in [FIGURE 15-2](#)).
2. Loosen the one thumbscrew.
3. Pull the operator panel out to remove it, and place it on a conductive mat (2 in [FIGURE 15-2](#)).

**FIGURE 15-2** Removing the Operator Panel





---

## 15.3 Mounting the Operator Panel

1. **Align the keyhole of the operator panel with the thumbscrew, and gently push the operator panel toward the server.**

If the operator panel will not move, gently adjust the position of the operator panel so that the light pipe on the front of the operator panel is aligned with the socket on the server front.

2. **Connect the signal cable of the operator panel.**
3. **Attach the thumbscrew.**
4. **Tighten the four screws to install the front panel.**

---

## 15.4 Reassembling the Server

1. **Attach the air duct.**

For details, see [Section 5.3.3, “Attaching the Air Duct”](#) on page 5-6.

2. **Attach the top cover.**

For details, see [Section 5.2.2, “Attaching the Top Cover”](#) on page 5-4.

3. **Slide the server into the equipment rack and secure the stabilizer bar.**

For details, see [Section 5.1.2, “Sliding the Server into the Equipment Rack”](#) on page 5-3.

4. **Power on the server.**

This procedure includes the steps of reconnecting the power cord, checking the LED status, and turning the mode switch on the operator panel to the Locked position. For details, see [Section 4.5.3.1, “Power-on by Using the XSCF Command”](#) on page 4-13.

5. **Check the hardware.**

This procedure includes the steps of running a program to verify that all the components have been remounted and starting the Solaris OS.

For details, see [Section 4.5.4, “Verifying the Hardware Operation”](#) on page 4-15.



# Components List

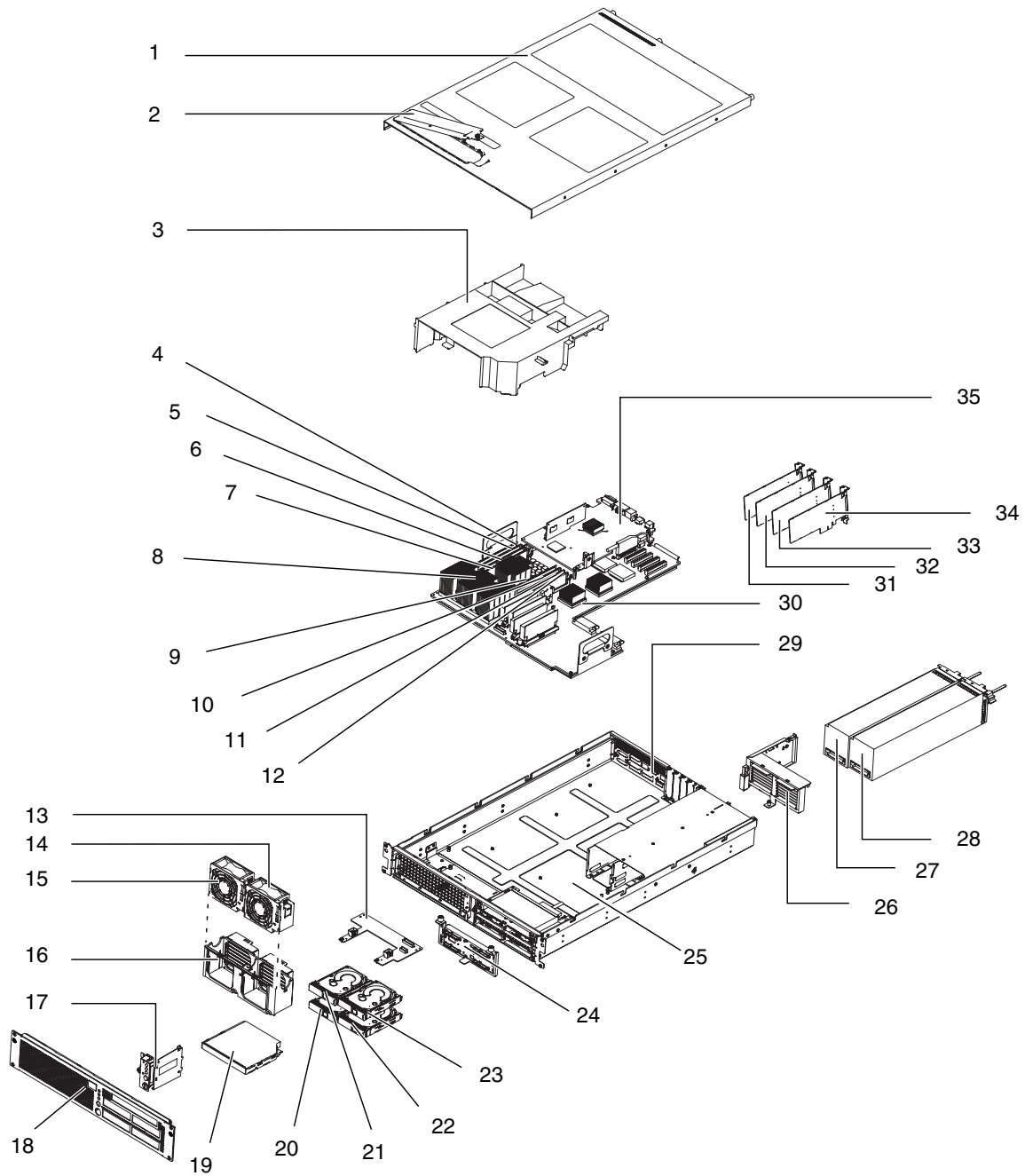
---

This appendix explains the server nomenclature and component numbering.

If multiple FRUs of the same type are mounted, the sign # and a sequential number are added to each of their names to differentiate between them.

[FIGURE A-1](#) shows the locations of the M3000 server components.

**FIGURE A-1** Location of Components



Location number	Component	Location number	Component
1	Top cover	19	CD-RW/DVD-RW drive unit (DVDU)
2	Fan cover	20	Hard disk drive (HDD#0)
3	Air duct	21	Hard disk drive (HDD#1)
4	Memory (MEM#00A)	22	Hard disk drive (HDD#2)
5	Memory (MEM#00B)	23	Hard disk drive (HDD#3)
6	Memory (MEM#01A)	24	Hard disk drive backplane (HDDBP#0)
7	Memory (MEM#01B)	25	Chassis
8	CPU (CPU#0)	26	Shutter unit
9	Memory (MEM#03B)	27	Power supply unit (PSU#0)
10	Memory (MEM#03A)	28	Power supply unit (PSU#1)
11	Memory (MEM#02B)	29	Rear panel
12	Memory (MEM#02A)	30	Motherboard unit (MBU_A)
13	Fan backplane (FANBP_B)	31	PCIe card (PCIe#0)
14	Fan unit (FAN_A#1)	32	PCIe card (PCIe#1)
15	Fan unit (FAN_A#0)	33	PCIe card (PCIe#2)
16	Fan cage	34	PCIe card (PCIe#3)
17	Operator panel (OPNL)	35	XSCF unit
18	Front panel		



# Memory Mounting Conditions

---

This appendix explains the memory (DIMM) mounting conditions.

- [Section B.1, “Confirmation of DIMM Information” on page B-1](#)
- [Section B.2, “Memory Mounting Conditions” on page B-3](#)

The DIMMs on a motherboard unit are classified into group A and group B (see [FIGURE 7-1](#)).



---

**Caution** – To replace or install a DIMM, do not fail to confirm the DIMM information and comply with the conditions to mount the memory.

---

---

## B.1 Confirmation of DIMM Information

Confirm the DIMM information (size/rank) in the following way.

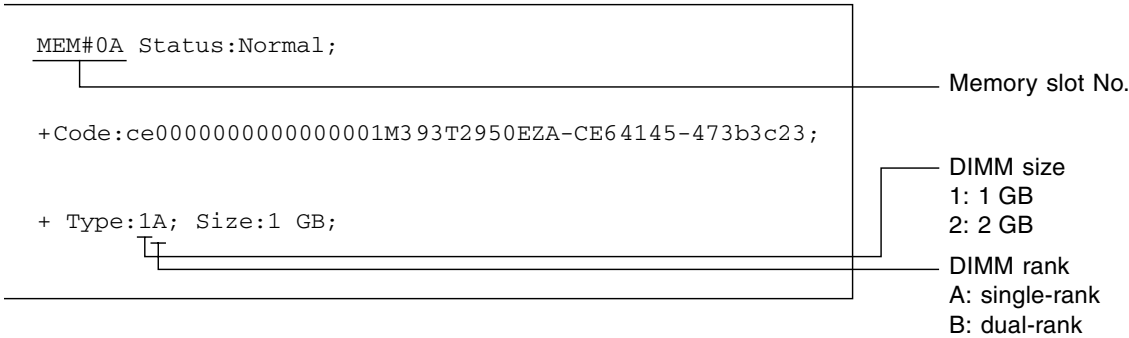
- Execute the `showhardconf(8)` command on XSCFU.

The “Type” field shows the DIMM size and the DIMM rank.

```
XSCF> showhardconf
...
  MBU_A Status:Normal; Ver:0101h; Serial:PP0829045F  ;
    + FRU-Part-Number:CA07082-D902 A1    /541-3302-01      ;
    + CPU Status:Normal;
      + Freq:2.520 GHz; Type:32;
      + Core:4; Strand:2;
    + Memory_Size:8 GB;
  MEM#0A Status:Normal;
    + Code:ce000000000000001M3 93T2950EZA-CE6 4145-473b3c23;
    + Type:1A; Size:1 GB;
  MEM#0B Status:Normal;
    + Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b2918;
    + Type:1A; Size:1 GB;
  MEM#1A Status:Normal;
    + Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b28af;
    + Type:1A; Size:1 GB;
  MEM#1B Status:Normal;
    + Code:7f7ffe00000000004aEBE10RD4AJFA-5C-E 3020-223b28ab;
    + Type:1A; Size:1 GB;
  ...
```

FIGURE B-1 shows the explanation of DIMM information.

**FIGURE B-1** Explanation of DIMM Information





---

## B.2 Memory Mounting Conditions

Memory mounting conditions are as follows:

- A maximum of eight DIMMs can be mounted. They are mounted in units of four DIMMs in each of group A and group B.
- The DIMM capacity of group A must be equal to or greater than that of group B. The DIMM capacity of group A must not be smaller than that of group B.
- The DIMMs included in the same group must have the same capacity and same rank.

FIGURE B-2 shows an example of mounting DIMM.

**FIGURE B-2** Example Mounting DIMM

MEM#00A	4GB/dual-rank
MEM#01A	
MEM#02A	
MEM#03A	
MEM#00B	2GB/single-rank
MEM#01B	
MEM#02B	
MEM#03B	

1. Mount DIMMs in group A first.

MEM#00A
MEM#00B
MEM#01A
MEM#01B
MEM#03B
MEM#03A
MEM#02B
MEM#02A

2. Mount DIMMs in group B.

DIMMs may not necessarily be mounted in group B.

MEM#00A
MEM#00B
MEM#01A
MEM#01B
MEM#03B
MEM#03A
MEM#02B
MEM#02A



# FRU List

This appendix shows the FRUs of the M3000 server. The FRU list consists of the following items:

- [Section C.1, “Server Overview” on page C-1](#)
- [Section C.2, “Motherboard Unit” on page C-2](#)
- [Section C.3, “Drive” on page C-5](#)
- [Section C.4, “Power Supply Unit” on page C-6](#)
- [Section C.5, “Fan Unit” on page C-7](#)



## C.1 Server Overview

[TABLE C-1](#) lists the M3000 FRU components.

**TABLE C-1** FRU components

Component	Redundant	Cold replacement	Hot replacement	Active replacement	Cold addition	Hot addition	Active addition
Motherboard unit (MBU_A)	No	Yes					
Memory (DIMM)	No	Yes			Yes		
PCIe card (PCIe)	No	Yes			Yes		
Hard disk drive (HDD)	Yes	Yes	Yes	Yes *	Yes	Yes	Yes
Hard disk drive backplane (HDDBP)	No	Yes					
CD-RW/DVD-RW drive unit (DVDU)	No	Yes					

**TABLE C-1** FRU components (*Continued*)

Component	Redundant	Cold replacement	Hot replacement	Active replacement	Cold addition	Hot addition	Active addition
Power supply unit (PSU)	Yes	Yes	Yes	Yes			
Fan unit (FAN_A)	Yes	Yes	Yes	Yes			
Fan backplane (FANBP_B)	No	Yes					
Operator panel (OPNL)	No	Yes					

- \* ■ A redundant configuration is created with the hard disk drive only when the disk mirroring software is used.
- If a hard disk drive is an unmirrored boot device, it must be replaced by using the cold replacement procedure. However, if a boot device can be disconnected by means of a Solaris OS function or disk mirroring software function, active replacement can also be performed. The procedure for disconnecting a hard disk drive varies depending on the software being used. For details, see the manuals for the relevant software.

## C.2 Motherboard Unit

The motherboard unit is the main circuit board of the M3000 server. The following components connect to the motherboard unit.

- [“Memory \(DIMM\)” on page C-2](#)
- [“PCIe Slot” on page C-3](#)
- [“CPU” on page C-4](#)
- [“XSCF Unit” on page C-4](#)

Power is supplied from the power supply units to the motherboard unit. To remove and replace the motherboard unit, power off the server. The replacement work is performed from the top of the server.

Because the CPU and the XSCF unit are connected directly to the motherboard unit, neither of them can be replaced individually.

For the replacement procedure, see [Chapter 6](#).

### C.2.1 Memory (DIMM)

The motherboard unit, which includes an ASIC called a memory access controller (JSC-MAC) and provides memory access control, has eight memory slots. To remove or mount DIMMs, power off the server. [TABLE C-2](#) shows DIMM specifications.

**TABLE C-2** DIMM Specifications

Item	Description
Maximum number of DIMMs	8
Location	On the motherboard unit
Active replacement	No
Hot replacement	No
Cold replacement	Yes

The memory consists of eight DIMMs in units of four. The server uses DDR2 SDRAM memory that has the following functions:

- ECC error protection
- Recovery from a memory chip error

For the replacement procedure, see [Chapter 7](#).

## C.2.2 PCIe Slot

The M3000 server provides four PCIe slots. Up to four low-profile type PCIe slots can be mounted in these PCIe slots.

A PCIe slot has the following functions:

- Supports the eight-lane PCI Express bus.
- High-speed serial point-to-point interconnect
- Extends the PCI data transfer rate to twice the value of PCI-X.

**TABLE C-3** PCIe slot specifications

Item	Description
Maximum number of PCIe cards	4
Location	Rear of the server
Active replacement	No
Hot replacement	No
Cold replacement	Yes

For the replacement procedure, see [Chapter 8](#).

# C.2.3 CPU

The SPARC 64™ VII processor is mounted on the CPU. The SPARC64 VII processor has the following features:

- Design adopting chip multithreading (CMT), in which a CPU sequentially performs multiple processes
- CPU consisting of four core processors
- SPARC instruction set architecture (ISA)
- Visual instruction set (VIS) extended instructions that accelerate processing of multimedia, networking, encryption, and Java™

TABLE C-4 shows the CPU specifications.

**TABLE C-4** CPU Specifications

Item	Description
Maximum number of CPUs	1
Number of CPU cores	4 cores
Location	On the motherboard unit

Because the CPU is mounted on the motherboard unit, it cannot be replaced singly. For information on how to replace the motherboard unit, see [Chapter 6](#).

# C.2.4 XSCF Unit

The service processor set that operates and manages the server is mounted in the XSCF unit.

The XSCF unit diagnoses and starts the entire system, configures domains, and detects and reports errors.



The XSCF unit provides the following functions by means of the XSCF firmware:

- Control and monitoring of the main unit hardware
- Monitoring of Solaris OS, power-on self-test (POST), and OpenBoot PROM
- Control and management of system administrator interfaces such as the maintenance terminal
- Control of device information
- Remote message output for various events

Because the XSCF unit is mounted on the motherboard unit, it cannot be replaced singly. For information on how to replace the motherboard unit, see [Chapter 6](#).

---

## C.3 Drive

The M3000 server consists of up to four hard disk drives and one CD-RW/DVD-RW drive unit.

### C.3.1 Hard Disk Drive

[TABLE C-5](#) shows hard disk drive specifications.

**TABLE C-5** Hard Disk Drive Specifications

Item	Description
Number of hard disk drives	4
Interface	SAS
Location	Front of the server
Active replacement/active addition	Yes (only when software mirroring is used)
Hot replacement/hot addition	Yes
Cold replacement/cold addition	Yes

An SAS device has two data ports. Because each data port resides in a different SAS domain, this enables complete failover redundancy. If one path fails, communication is performed through the other independent path.

For the replacement procedure, see [Chapter 9](#).

### C.3.2 CD-RW/DVD-RW Drive Unit (DVDU)

TABLE C-6 shows CD-RW/DVD-RW drive unit specifications.

**TABLE C-6** CD-RW/DVD-RW Drive Unit Specifications

Item	Description
Number of CD-RW/DVD-RW drive units	1
Interface	Advanced Technology Attachment Packet Interface (ATAPI)
Location	Above hard disk drive
Active replacement	No
Hot replacement	No
Cold replacement	Yes

For the replacement procedure, see [Chapter 11](#).

## C.4 Power Supply Unit

The power supply unit provides the server with power received from the external AC power source. The redundant configuration allows continued server operation if a power supply unit fails. TABLE C-7 shows the power supply unit specifications.

**TABLE C-7** Power Supply Unit Specifications

Item	Specifications
Number of power cords	2 (1 for each power supply unit)
Power cord length	3 m/9.84 ft
Cooling fan unit	2 (1 for each power supply unit)
Redundancy	1 + 1 redundant configuration
Input voltage	AC 100 to 120 V AC 200 to 240 V
Rated current *	4.80 A (AC 100 to 120 V) 2.59 A (AC 200 to 240 V)
Frequency	50/60 Hz

**TABLE C-7** Power Supply Unit Specifications (*Continued*)

Item	Specifications
Power consumption	470 W (AC 100 to 120 V) 460 W (AC 200 to 240 V)
Apparent power	480 VA (AC 100 to 120 V) 517 VA (AC 200 to 240 V)
Maximum heat dissipation	1,603.7 BTU/hr 1,692 kJ/hr (AC100 to 120V) 1,569.6 BTU/hr 1,656 kJ/hr (AC200 to 240V)
Power factor	0.98 (AC 100 to 120 V for the maximum configuration) 0.89 (AC 200 to 240 V for the maximum configuration)
Active replacement	Yes
Hot replacement	Yes
Cold replacement	Yes

\* In the redundant configuration, the rated current supplied for each power cord is half of the value listed in [TABLE C-7](#).

For the replacement procedure, see [Chapter 12](#).

## C.5 Fan Unit

The fan units generate an airflow between the inside and outside of the server. If an error occurs in one fan unit, the XSCF detects the error and the normally operating fan unit starts rotating at a higher speed to cool the server. The M3000 server uses the fan units (FAN\_A) as its main cooling system. [TABLE C-8](#) shows the fan unit specifications.

**TABLE C-8** Fan Unit Specifications

Item	Description
Number of fan units	2
Redundancy	2 units (1 + 1 redundant configuration)
Location	Front of the server

**TABLE C-8** Fan Unit Specifications (*Continued*)

Item	Description
Active replacement	Yes
Hot replacement	Yes
Cold replacement	Yes

For the replacement procedure, see [Chapter 13](#).

# External Interface Specifications

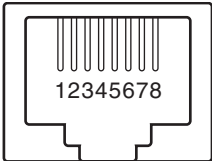
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This appendix explains the specifications of the external interface connectors provided on the M3000 server.

- [Section D.1, “Serial Port” on page D-2](#)
- [Section D.2, “UPC Port” on page D-2](#)
- [Section D.3, “USB Port” on page D-3](#)
- [Section D.4, “SAS port” on page D-3](#)
- [Section D.5, “Connection Diagram for Serial Cable” on page D-4](#)

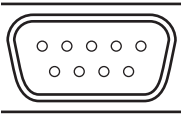
# D.1 Serial Port

TABLE D-1 Serial Port

Pin assignment	Pin number	Signal name	Input/output	Description
	1	RST	Output	Request to Send
	2	DTR	Output	Data Terminal Ready
	3	TXD	Output	Send Data
	4	GND	---	Ground
	5	GND	---	Ground
	6	RXD	Input	Receive Data
	7	DSR	Input	Data Set Ready
	8	CTS	Input	Clear to Send

# D.2 UPC Port

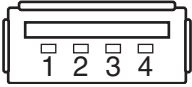
TABLE D-2 UPC Port

Pin assignment	Pin number	Signal name	Input/output	Description
	1	ER	---	---
	2	NC	---	Not connected
	3	NC	---	Not connected
	4	NC	---	Not connected
	5	SG	---	Ground
	6	*BPS	Input	UPS hardware error signal
	7	*BTL	Input	Battery end of discharge warning signal
	8	NC	---	Not connected
	9	*ACOFF	Input	Power failure detection signal



# D.3 USB Port

TABLE D-3 USB Port

Pin assignment	Pin number	Signal name	Input/output	Description
	1	VBUS	Output	Power supply
	2	-DATA	Input/output	Data
	3	+DATA	Input/output	Data
	4	GND	---	Ground



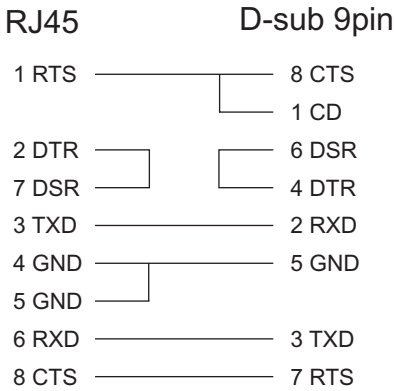
# D.4 SAS port

The SAS port connects the server to an external device, such as a tape drive, which has a SAS interface. For information on which devices can be connected, contact a service engineer.

Note that one or two lanes can be used with this port.

# D.5 Connection Diagram for Serial Cable

FIGURE D-1 Connection Diagram for Serial Cable





# UPS Controller

---

This appendix explains the UPS controller (UPC) that controls the uninterruptible power supply (UPS) unit.

- [Section E.1, “Overview” on page E-1](#)
- [Section E.2, “Signal Cable” on page E-2](#)
- [Section E.3, “Configuration of Signal Lines” on page E-3](#)
- [Section E.4, “Power Supply Conditions” on page E-5](#)
- [Section E.5, “UPS Cable” on page E-6](#)
- [Section E.6, “Connections” on page E-7](#)

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## E.1 Overview

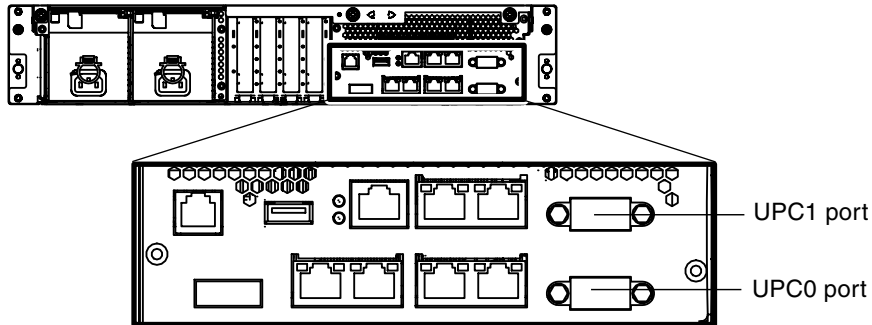
The UPS is a unit to ensure a stable supply of power to the system even in the event of a power supply failure or a massive blackout.

When the UPC port on the server is connected to the UPS signal cable that has a UPC interface, if the UPS detects a power failure, it notifies the server of the failure so that the server can perform emergency shutdown processing. This stops the server safely.

FIGURE E-1 shows the location of the UPC port on the M3000 server.

**FIGURE E-1** UPC Port Locations

Rear view



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## E.2 Signal Cable

Use the shielded pair cable with the following specifications.

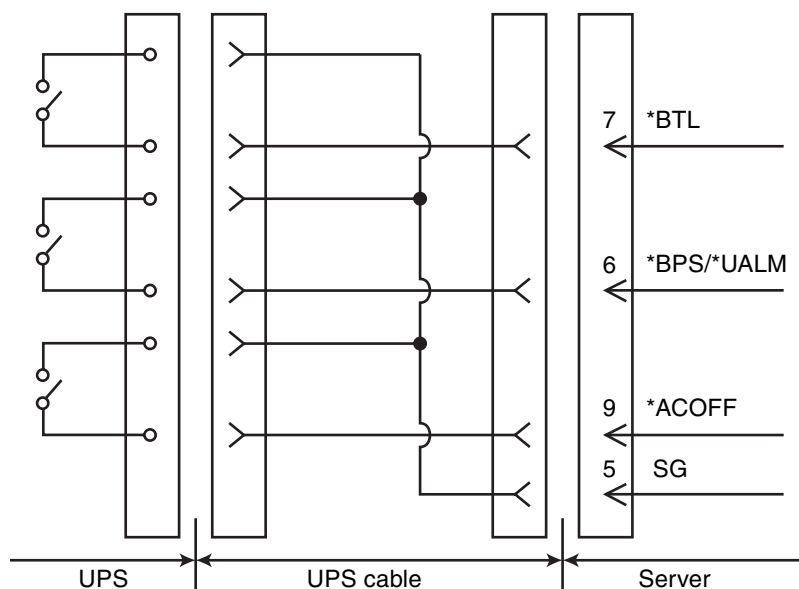
- Direct current resistance (roundtrip/pair): 400 W/km or less
- Cable length: Up to 10 m (33 ft.)

## E.3 Configuration of Signal Lines

This section provides the signal definitions.

FIGURE E-2 shows the configuration of signal lines when the UPS is connected.

**FIGURE E-2** Connection between the Server and UPS



**TABLE E-1** Signal Line Definitions

Signal name	Definitions	Pin number	Remarks
*BPS/*UALM	Indicates a UPS error.	6	Normal state: Off Abnormal state: On
*BTL	Indicates that the battery level of the UPS has decreased and warns that battery power will be unavailable after a certain period of time has elapsed.	7	Normal state: Off Abnormal warning: On (Note 1)

**TABLE E-1** Signal Line Definitions (*Continued*)

Signal name	Definitions	Pin number	Remarks
*ACOFF	Indicates that a power failure has occurred in the commercial power supply connected to the UPS.	9	Normal state: Off Abnormal state: On (Note 2)
SG	Signal ground	5	
ER (Equipment Ready)	Indicates that the server is operating	1	Do not connect anything to this pin.

On: Indicates that the contact is closed.

Off: Indicates that the contact is open.

Note 1: Use a UPS that can normally supply power from the battery at least 10 to 60 seconds after \*BTL is turned on.

Note 2: Use a UPS that can normally supply power from the battery within 2 seconds of a momentary commercial power interruption even if \*ACOFF is not turned on.

## E.4 Power Supply Conditions

TABLE E-2 and TABLE E-3 show the power supply conditions of the UPC interface.

### E.4.1 Input Circuit

TABLE E-2 Input Power Supply Conditions

Signal name	Input conditions
*BPS/*UALM	No voltage relay contact
*BTL	Contact rating DC 12 V, 10 mA or greater (0.5 A maximum)
*ACOFF	Use of a gold-plated contact or reed relay is recommended.

Limit the signal line chattering period to 1 ms.

### E.4.2 Output Circuit

TABLE E-3 Output Power Supply Conditions

Signal name	Output conditions		
ER	Output voltage	VOH	DC 3.1 V (minimum)
		VOL	DC 0 - 0.4 V (maximum)
	Output current	IOH	-4 mA (maximum)
		IOL	4 mA (maximum)

# E.5 UPS Cable

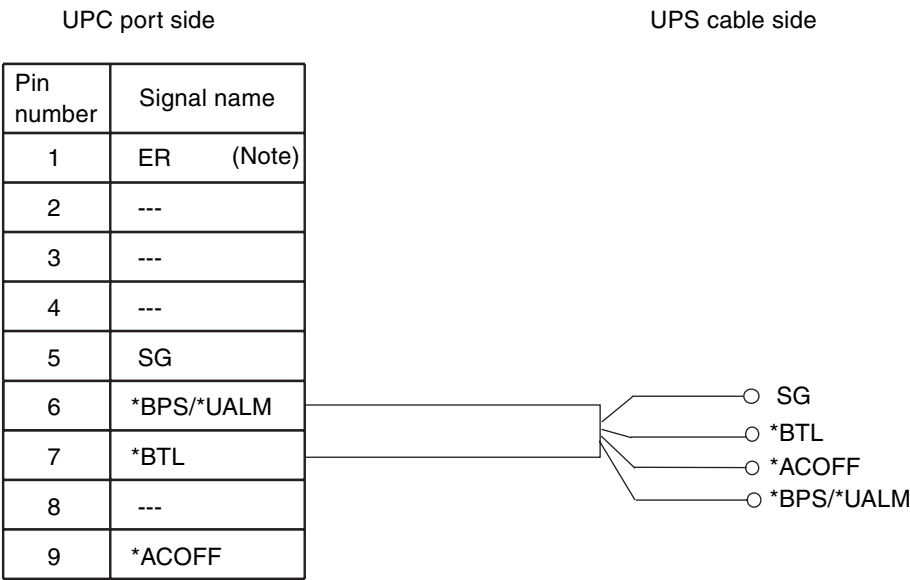
The UPS cable specifications are as follows:

- Connector shape  
D-SUB9 pin male (receptacle side: female)  
DEU-9PF-F0
- Terminal array

FIGURE E-3 shows the pin signals of the UPC port and UPS cable.

Do not use any pin that is not defined (Pin 2, 3, 4, and 8 in FIGURE E-3). The pins on the cable side are as follows:

FIGURE E-3 Correspondence between the UPC Ports and the UPS Cable Pins



Note: Do not connect to the ER signal pin.

If a UPS cable is required, it must be prepared separately. For details, contact your sales representative.

---

## E.6 Connections

This section explains the connection between the UPC port and UPS.

- UPC#0 connects to UPS#0, and UPC#1 connects to UPS#1.
- Single power feed uses only UPC#0.
- Dual power feed uses UPC#0 and UPC#1.





# Abbreviations

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## A

<b>ASIC</b>	Application-specific integrated circuit
<b>AT</b>	Advanced technology
<b>ATAPI</b>	AT attachment packet interface

## B

<b>BUI</b>	Browser-based user interface
------------	------------------------------

## C

<b>CH</b>	Channel
<b>CMP</b>	Chip multi-processor
<b>CMT</b>	Chip multi-threading
<b>CB</b>	Circuit breaker
<b>CLKU</b>	Clock control unit
<b>CLI</b>	Command-line interface
<b>CMU-CH</b>	CMU channel
<b>CE</b>	Correctable error
<b>CPU</b>	Central processing unit

## D

<b>DCL</b>	Domain component list
<b>DDC</b>	DC to DC converter
<b>DE</b>	Diagnosis engine
<b>DID</b>	Domain ID
<b>DIMM</b>	Dual inline memory module
<b>DRAM</b>	Dynamic random access memory

## E

<b>Ecache</b>	External cache
<b>ECC</b>	Error correction code

## F

<b>FANBP</b>	Fan backplane
<b>FMA</b>	Fault management architecture
<b>FRU</b>	Field-replaceable unit

## G

<b>GBps</b>	Gigabyte per second
<b>GHz</b>	Gigahertz
<b>GUI</b>	Graphical user interface

## H

<b>HDD</b>	Hard disk drive
<b>HDDBP</b>	Hard disk drive backplane

## I

<b>I2C bus</b>	Inter integrated circuit bus
<b>ISA</b>	Instruction set architecture
<b>IOBP</b>	I/O backplane

## L

<b>LCD</b>	Liquid crystal display
<b>LED</b>	Light emitting diode
<b>LSB</b>	Logical system board
<b>LSI</b>	Large scale integration

## M

<b>MAC</b>	Media access control address
<b>MBC</b>	Maintenance bus controller
<b>MEM</b>	Memory modules
<b>MBU</b>	Motherboard unit

## N

<b>NTP</b>	Network time protocol
<b>NVRAM</b>	Non-volatile random access memory

## O

<b>OPNL</b>	Operator panel
<b>OS</b>	Operating system

## P

<b>PCIe</b>	PCI express
<b>POST</b>	Power-on self-test

<b>POR</b>	Power-on reset
------------	----------------

<b>PSB</b>	Physical system board
------------	-----------------------

<b>PSU</b>	Power supply unit
------------	-------------------

## R

<b>PROM</b>	Programmable read-only memory
-------------	-------------------------------

<b>RAM</b>	Random access memory
------------	----------------------

## S

<b>SAS</b>	Serial attached SCSI
------------	----------------------

<b>SATA</b>	Serial ATA
-------------	------------

<b>SRAM</b>	Static RAM
-------------	------------

<b>SC</b>	System controller
-----------	-------------------

## T

<b>TC</b>	Throughput computing
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<b>TOD</b>	Time of day
------------	-------------

## U

<b>UE</b>	Uncorrectable error
-----------	---------------------

<b>UPC</b>	UPS controller
------------	----------------

<b>UPS</b>	Uninterruptible Power Supply
------------	------------------------------

## X

<b>XCP</b>	XCSF control package
------------	----------------------

<b>XIR</b>	Externally initiated reset
------------	----------------------------

<b>XSB</b>	eXtended system board
------------	-----------------------

<b>XSCF</b>	eXtended System Control Facility
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<b>XSCFU</b>	eXtended system control facility unit
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